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CERTAIN SYMBIOTIC BACTERIAL INFECTIONS PRODUCING GANGRENE

WITH SPECIAL REFERENCE TO THE PRINCIPLES OF TREATMENT

J. SHELTON HORSLEY, M.D.

RICHMOND, VA.

During the last few years F. L. Meleney [1] has written interestingly on symbiotic infections, and this subject is attracting much attention. Symbiosis of bacteria occurs when two or more kinds of bacteria are closely associated and live together harmoniously. Synergism means that there is some result from this association of bacteria not apparent from the bacteria in pure culture. Thus, a synergism would be necessarily symbiotic, but a symbiotic relation is not necessarily a synergism. In bacterial parasitism, bacteria prey on the host to the disadvantage of the host. Parasitism may merge into a symbiotic relation.

A. M. Shipley [2] says that the whole subject of symbiosis and infection is going to be one of the new fields for surgeons and bacteriologists. He calls attention to the fact that in the World War it was noticed that streptococci when accompanied by anaerobes produced a clinical condition that had rarely been seen before.

According to Meleney, infections in the abdominal wall when mixed are almost always more severe than from a single organism. Castellani [3] believes that many symptoms in certain diseases, such as the excessive tympanitis in typhoid, ascribed to causative bacteria are really due to an association with a symbiotic organism. The bacteriology of Vincent's angina has not been definitely determined, but it is considered by some to be the symbiotic relationship between a fusobacterium and a spirillum. Others think that it is merely a morphologic variation of the same organism. Knorr [4] believes that in connection with some streptococci in the mouth these organisms cause certain results that cannot be produced when separated from streptococci. In cultures from the mouth made under a seal, streptococci first predominate, then the fusiform bacteria, then the spirilla and last of all spirochetes. According to Knorr, one kind of bacteria prepares the ground for the other, and infection of the mouth with the fusiform bacteria or spirilla comes only after a preliminary infection with streptococci.

Meleney has shown that, in studies of raw catgut, instances were found in which the combination of bacteria in a single specimen of catgut would cause death when injected into an animal, while the pure cultures of the organisms injected separately had but little effect. In two specimens of improperly sterilized catgut there was a mixture of organisms which promptly killed the laboratory animals when injected together, but when the two organisms were injected separately each organism was entirely nonpathogenic. Apparently in acute appendicitis and in peritonitis certain combinations of intestinal bacteria produce a more profound effect than the bacteria would in pure culture. Human bites frequently cause serious infections, when the only organism found, according to Meleney, are nonpathogenic in pure culture.

PROGRESSIVE GANGRENOUS ULCERATION

An interesting example of symbiotic and synergistic bacterial infection is the progressive gangrenous ulcer of the abdominal wall following a surgical operation, the first case having been reported by T. S. Cullen [5] in 1924. This disease seems to constitute a clinical entity and has varied but little from Cullen's first description. In a recent article by Frank S. Lynn,[6] all the reported cases occurring on the abdominal wall have been collected, and another case, treated by Lynn, was added.

In these ulcers of the abdominal wall the infection appears within one to three weeks after the operation. Usually there is drainage of an appendicular abscess or drainage in which the intestinal tract or the gallbladder has been opened. In Freeman's [7] case, however, the infection and gangrene followed an operation on the gallbladder in which the wound was closed without drainage and had apparently healed, though the sutures had not been removed. The infection began around a stitch-hole on the twelfth day and progressed until an intervening uremia caused death about six weeks after the first symptoms. This case did not present, however, the advancing ulceration with an elevated and sharply marked border that usually occurs.

From the Surgical Department of St. Elizabeth's Hospital.

Read before the Southern Surgical Association at White Sulphur Springs, W. Va., Dec. 8, 1931.

1. Meleney, F. L.: Hemolytic Streptococcus Gangrene, Arch. Surg. **9**: 317 (Sept.) 1924; Bacterial Synergism in Disease Processes, with a Confirmation of the Synergistic Bacterial Etiology of a Certain Type of Progressive Gangrene of the Abdominal Wall, Ann. Surg. **94**: 961-981 (Dec.) 1931.

2. Shipley, A. M.: Progressive Gangrenous Ulceration of the Abdominal Wall, Ann. Surg. **87**: 245 (Feb.) 1928.

3. Castellani, Aldo: Fermentation Phenomena When Different Species of Micro-Organisms are in Close Association, Proc. Soc. Exper. Biol. & Med., 1926, pp. 481-488; Importance of Symbiosis, or Close Association of Different Species of Organism in Production of Certain Diseases and Certain Symptoms of Disease, J. A. M. A. **87**: 15-22 (July 3) 1926; J. Trop. Med. **29**: 217-226 (Aug. 2) 1926; "Symbiotic Fermentation Phenomenon" and Its Use in Differentiation of Certain Micro-Organisms and in Identification of Certain Carbon Compounds, Ann. de l'Inst. Pasteur **42**: 461-474 (April) 1928.

4. Knorr, M.: Ueber die fusospirillare Symbiose, die Gattung Fusobacterium und Spirillum sputigenum, Centralbl. f. Bakt. (orig.) **87**: 536-545, 1922.

5. Cullen, T. S.: A Progressively Enlarging Ulcer of the Abdominal Wall Involving the Skin and Fat, Following Drainage of an Abdominal Abscess Apparently of Appendiceal Origin, Surg., Gynec. & Obst. **38**: 579 (May) 1924.

6. Lynn, F. S.: Postoperative Gangrenous Ulcer of the Abdominal Wall, J. A. M. A. **97**: 1597 (Nov. 28) 1931.

7. Freeman, Leonard: Progressive, Gangrenous, Painful Ulceration of the Abdominal Skin and Subcutaneous Tissues Following Operation, Ann. Surg. **92**: 779-785 (Oct.) 1930.

This ulcerative process usually begins around a stitch or a stitch-hole. The affected region becomes quite painful, swollen and purple, and quickly ulcerates. There is a necrotic center, and the ulcerating process extends in a more or less serpiginous manner. The margins are elevated and the ulcerated area is covered largely with necrotic tissue which extends up to the elevated margin. There is an area of distinct redness around the ulceration. The infection seems to be confined to the subcutaneous fat and fascia and the skin. The ulcer is very painful and the dressings are often particularly distressing. There is usually only a moderate elevation of temperature, and the infection, though it may cover almost the whole abdomen, does not attack the muscles or the aponeurosis of the abdominal wall. The course of the disease depends partly on the treatment but may last as long as twenty-two months.

That this lesion, however, is not confined to the abdominal wall is obvious from many reports, such as the case of Probstein and Seelig [8] following an operation on the mammary gland. Several instances have been reported in which this ulcerative infection followed operations for empyema. Max Ballin [9] has reported four cases of progressive gangrenous ulceration, one following the drainage of an abscess of an inguinal gland and lasting for twenty-two months; the second following a thoracotomy; the third, the drainage of a gangrenous appendix, and in the fourth case the lesion resulted from an abscess of the epididymis breaking through the scrotum. Christopher's [10] case followed thoracotomy for empyema and involved most of the chest wall.

ETIOLOGY

The case of Cole and Heideman [11] followed a typical clinical course. It occurred at the site of a suture eighteen days after an operation for a ruptured appendix. In this case, however, an ameba was demonstrated, and it was suggested that Ameba histolytica is always responsible for this lesion. Emetine and roentgen therapy were followed by improvement, but there was later an extension of the disease and healing occurred only after the ulcer was excised with the cautery about three months after the first appearance of the infection.

Adam Kemble [12] mentions three cases in which this ameba has been demonstrated in the feces, in the margin of the ulcer and migrating between tissue cells in the reticulo-endothelial area. Meleney, however, says that in the two cases that he has reported amebas have not been found and suggests that the synergistic bacterial etiology is followed by a secondary contamination with amebas in those cases in which amebas are found. He states that F. W. O'Connor, of the Department of Tropical Diseases, confirmed the absence of amebas in the two cases that he reported. It is, of course, possible but rather improbable that the same general type of clinical entity may be produced by different types of micro-organisms. It is difficult to believe that, in the typical cases reported by Meleney with careful bacteriologic observations, amebas could have been overlooked.

It seems significant that the cases in which it was demonstrated that the amebas were present were not permanently or materially benefited by the usual treatment for amebas, such as emetine.

According to Meleney this gangrenous ulcerative process results from a symbiotic synergistic infection with two types of bacteria, a streptococcus which is anaerobic by preference but which later will grow in the presence of oxygen, and a hemolytic Staphylococcus aureus. The streptococcus is what he terms a nonhemolytic micro-aerophilic streptococcus, one of the groups frequentiy found in the human intestine and in peritoneal exudates. It is often missed, according to Meleney, unless anaerobic cultures are first made. This streptococcus forms a large percentage of the bacteria of peritoneal exudates.

The etiology seems to be, first, an infection with doubtless numerous bacteria in which this nonhemolytic micro-aerophilic streptococcus predominates. Later there is infection with the staphylococcus, usually Staphylococcus aureus, and it is the synergistic action of these two bacteria that produces an effect not caused by either one in pure culture. Just how this effect is produced is not known, but it does not seem to be one of a sequence, as in certain carbohydrates in which an acid-forming bacterium initiates a process that another organism completes. Meleney thinks that it is necessary for these bacteria to be growing together intimately and that "the product which causes the gangrene is made by the action of one organism on some intermediate product of metabolism produced by the other, as is the case with certain combinations of fermentative bacteria." In examinations of the tissue the streptococcus is found in advance of the ulcerating process, occupying the reddened area of the skin and the subcutaneous tissue and penetrating even beyond this, but on the gangrenous margin of the ulcer a mildly hemolytic Staphylococcus aureus is found.

Meleney has shown that if the nonhemolytic micro-aerophilic streptococcus and the mildly hemolytic Staphylococcus aureus are injected into a rabbit, dog or guinea-pig separately, the streptococcus causes but little disturbance. The staphylococcus will cause an abscess. If these two cultures, however, are mixed and injected together, a gangrenous area resembling that of the progressive gangrenous ulcer of the abdominal wall results. The streptococcus seems to penetrate more readily than the staphylococcus, so that if the areas of injection are close together the gangrenous area would be more likely to be produced in the sphere of the staphylococcus. In pure culture, however, and by various laboratory tests on gelatin, milk, dextrose, and the like, the cultures of this streptococcus and staphylococcus present no unusual features when cultivated together from what they would show separately. It is only when they are injected together into a living animal that the peculiar synergistic effect appears.

Microscopic examination of the area of ulceration seems to show that there is an extensive fragmentation of the subcutaneous connective tissue and a heavy cellular infiltration of the fat. There is no evidence of thrombosis of the blood vessels. The vessels are dilated and filled with blood. Gangrene, according to Meleney, is due to the direct action of some lytic substance rather than to the cutting off of the blood supply.

8. Probstein, J. G., and Seelig, M. G.: The Treatment of Postoperative Progressive Gangrenous Infection of the Skin and Subcutaneous Tissue with Blood from Immunized Donors, Surg., Gynec. & Obst. **47**: 247 (Aug.) 1928.

9. Ballin, Max, in discussion, Tr. Am. S. A., 1930, pp. 131-132.

10. Christopher, Frederick: Severe Spreading Carbuncular Infection of Chest Wall, Following Rib Resection Under Local Anesthesia, S. Clin. North America **4**: 795 (June) 1924.

11. Cole, W. H., and Heideman, M. L.: Amebic Ulcer of Abdominal Wall Following Appendectomy with Drainage, J. A. M. A. **92**: 537 (Feb. 16) 1929.

12. Kemble, Adam: Personal communication to the author, Dec. 8, 1931.

Gram stained tissue showed positive cocci toward the center of the lesion and scattered organisms in diplo form or in short chains toward the periphery.

Meleney also found that the injection of these two bacteria in barium and agar in the lungs of experimental animals produced a more profound infection in the lung than either bacterium injected singly.

Case 1 is a typical instance of progressive gangrenous ulceration:

CASE 1.—T. L. S., a white man, aged 45, was operated on by Dr. John S. Horsley, Jr., June 17, 1931; the cecum and appendix were buried in an inflammatory mass which was difficult of access and included a small abscess. The appendix had perforated. Drainage was placed to the abscess. The patient made a satisfactory immediate operative recovery, particularly when the extent of the inflammatory exudate is considered. The drainage was removed gradually, the last tube being taken out June 29, and the wound seemed to be in satisfactory condition. July 8, twenty-one days after the operation, however, it was noticed that there was ulceration and necrosis around the outer margin of the wound. The skin was congested and the margin of the ulcerated area was swollen and necrotic. The ulceration extended quite rapidly and was very painful. There was no evidence of gas gangrene. Bacteriologic examination showed streptococci, gram-negative bacilli and gram-positive cocci. The patient's Wassermann reaction was negative. Bacteriologic examination, July 9, showed gram-negative bacilli, gram-positive diplococci and streptococci.

July 9, with general anesthesia, I excised the ulcerated area in the outer portion of the wound with the cutting endotherm cautery. The lesion was confined to the skin and subcutaneous fat. With the finger a sinus was demonstrated running beneath the skin inward for about 3 inches. The skin and fat over this sinus were divided with the endotherm knife. The whole wound was thoroughly cauterized with the hot electric cautery. The deeper portion of the abdominal wound appeared in good condition. There was a small granulating area that seemed to represent the site of the drainage track, but a smear from this did not show any bacteria. This area, however, was thoroughly cauterized.

The patient was much more comfortable immediately following the operation. It seems typical of these cases that cauterization with the hot cautery gives instant relief from pain. The wound granulated satisfactorily and appeared to be healing, but after ten days at the extreme inner portion of the wound a slight recurrence of the necrotic ulcerative process was observed. This area was excised with the endotherm knife by Dr. John S. Horsley, Jr., July 19, local anesthesia being used. The granulations soon became healthy; skin grafts were applied, and the wound then healed rapidly. The patient was discharged from the hospital, September 1, and has since had no further trouble.

As Lynn has suggested, it is probable that the mortality from this disease is greater than the recorded cases show. In his collected series of twenty-one cases there is only one death. In the discussion of his case, Lynn says "In the last few days, in talking to some of my friends from various places, I have learned of five other cases, and four of those cases terminated fatally."

GANGRENE OF THE ABDOMINAL WALL

Another type of this apparently symbiotic infection which I [13] have reported before is a case of gangrene of the abdominal wall:

CASE 2.—J. W. M., a white man, aged 67, was admitted with symptoms of acute intestinal obstruction which was due to a lipoma in the lower ileum. Operation, Dec. 14, 1927, showed an intussusception with the lipoma at its apex. The intussusception was reduced, the lipoma removed, and a tubal enterostomy was done. The patient had a rather fat abdomen, the wound was somewhat triangular, being first a McBurney incision which was extended upward at the inner angle along the right rectus muscle. Two days after the operation gangrene was seen at the angle of the wound and rapidly involved the whole thickness of the abdominal wall extending outward. At the inner portion of the wound a loop of bowel was exposed, and, as the whole thickness of the abdominal wall was gangrenous over a considerable area, it was feared that he would become disemboweled on exertion or coughing. Eight days after the original operation an extensive gangrenous area involving the whole thickness of the abdominal wall was excised with the hot electric cautery. There were a few flimsy adhesions of the intestine. A portion of an inner tube of an automobile tire was sutured in the wound, and seven days later, after granulations and a partly organized exudate had occurred over the exposed bowel, the rubber was removed. A flap consisting of skin and of fat along the upper margin of the wound was transplanted in stages and covered the bowel.

The patient had a severe pharyngitis, and a gastrostomy was done for feeding. He eventually recovered, however, and when heard from last, Nov. 3, 1931, nearly four years after the operation, he was in good general condition. There was a ventral hernia, comfortably controlled by an abdominal support.

The bacteriologic report showed gram-negative bacilli, a few short chains of streptococci, large gram-positive diplococci, a few large gram-positive bacilli and many gram-positive cocci. Cultures from the wound after forty-eight hours in a blood sugar medium showed many diphtheroid bacilli, many small gram-negative bacilli (colon bacilli), a few short chains of streptococci and many gram-positive staphylococci. Cultures in plain agar showed nonhemolytic streptococci, nonhemolytic staphylococci and Staphylococcus aureus. Cultures in dextrose broth showed many gram-positive cocci (staphylococci), a few large gram-positive diplococci, occasional short and long chain streptococci, and many small and large bacilli, both gram negative and gram positive.

FULMINATING SYMBIOTIC INFECTION

The following case presents what seems to be a severe fulminating symbiotic synergistic infection occuring without any noticeable primary wound:

CASE 3.—C. E. W., a married man, aged 33, living in Lynchburg, Va., had had previous good health. The Wasserman reaction was negative. Feb. 16, 1931, he had pains in both legs. The following day there was a burning over his body without any fever, as far as he knew. Following this he had generalized itching. As other members of his family had influenza at this time, he thought he had influenza. He was in bed for four or five days and then was up around the house for a day. About February 21, he noticed two small inflamed areas, one on the lower inner portion of the left thigh and the other just below Poupart's ligament on the left side. He was not aware of having been injured, and the only skin lesion was a small scratch on his hand, which was apparently not infected. February 22, he was seen by Dr. F. M. Perrow of Lynchburg. The lesion near the knee on the left thigh looked quite insignificant. "It had a black top about the size of a small grain of corn, with very little redness or swelling about it, but considerable induration and was exquisitely tender. The black top seemed to be composed of dead epithelium, stuck tight, and on lifting it with the point of a knife only a little serum but no pus oozed out. The area in the groin was slightly larger and beneath the black top a white core could be seen. Great tenderness existed throughout Scarpa's triangle." The inflamed areas continued to extend rapidly along the inner side of the thigh up to the left groin. The infection not only seemed to be spreading rapidly but also was very virulent. Hot applications gave no relief. The patient had slight elevations of temperature with no decided chill. During this time the urine showed a most peculiar pink color with a slight trace of albumin, some casts, a few blood cells and a trace of sugar. He had several vomiting spells, and never ceased to complain of pain in the groin.

13. Horsley, J. S.: Intussusception Due to Intestinal Lipoma in an Adult, Followed by Gangrene in the Abdominal Wall, Arch. Surg. 18: 882 (March) 1929.

I saw him first in Lynchburg, February 26, with Dr. Don Preston Peters and Dr. Perrow, who kindly referred him to me. His condition was apparently desperate. His temperature the previous day had been 100 F. with a pulse of 140, and his blood pressure had dropped greatly but had been improved by a small transfusion of blood. The infection involved the skin and subcutaneous fat on the inner side of the thigh up to the groin and extended over Poupart's ligament to the left anterior-superior spine of the ilium. Along this area, which was swollen and red, were regions of necrotic tissue. A short incision had been made by Dr. Peters and a drain placed. Around the drain the tissue was necrotic and there was a dirty, but not foul, thin discharge. Under ether anesthesia the necrotic tissue of the groin and thigh was excised so far as possible with the hot electric cautery, and the tissue that could not be excised because of the proximity to the femoral vessels was cauterized with the electric cautery. The infected area that was not gangrenous was laid open with the cautery. Dressings of hypertonic salt solution were applied.

The following day the patient seemed somewhat better; his temperature was about 100 F. and his pulse ran between 120 and 128, although the infection had rapidly extended along the left thorax to about the base of the axilla. Forty-eight hours after the first operation this area was swollen, edematous and red, but there was no necrotic area on the skin. His temperature then was 103.8 F., pulse 128 and respirations 30. Under ether anesthesia again, an incision was made with the endotherm knife from the left anterior-superior spinous process to the base of the left axilla and downward on the outer surface of the thigh. The tissues were dissected up with the endotherm knife and exposed an area of early necrosis in the subcutaneous fat, the skin being swollen and red but not necrotic. The infection throughout seemed to follow this subcutaneous fat and involved the skin secondarily. The muscles and deep fascia were not apparently involved at any point. Much of this necrotic tissue was excised with the endotherm and the rest was cauterized thoroughly with the hot electric cautery. Temporary sutures were placed in the flaps of tissue that had been widely undermined with the cautery, the wound was packed with gauze, and drainage tubes were placed. Two hours after this operation the temperature had come down to 102, pulse 112, and respirations 20. The following day a small transfusion of blood was given by the citrate method, which was followed by a rather severe reaction with a chill, a temperature of 105.8, a pulse of 138 and respirations 54. Continuous intravenous injection of 5 per cent dextrose in Ringer's solution was given from the first operation for five days.

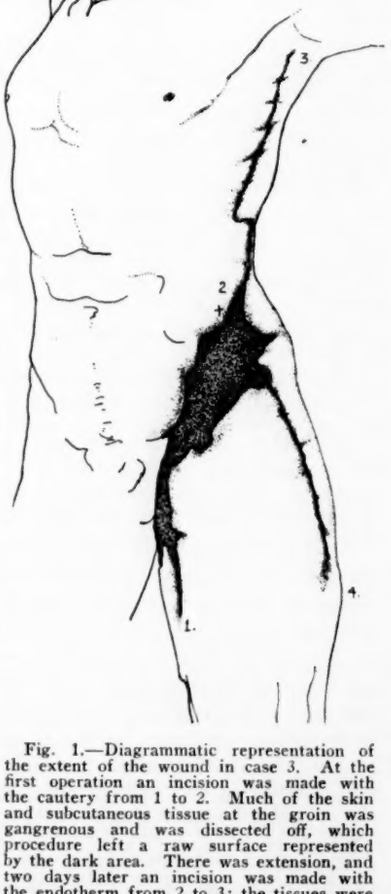

Fig. 1.—Diagrammatic representation of the extent of the wound in case 3. At the first operation an incision was made with the cautery from 1 to 2. Much of the skin and subcutaneous tissue at the groin was gangrenous and was dissected off, which procedure left a raw surface represented by the dark area. There was extension, and two days later an incision was made with the endotherm from 2 to 3; the tissues were widely opened, and much of the subcutaneous fat, which was markedly necrotic, was dissected out with the hot electric cautery. The portion that could not be dissected out was cauterized with the hot cautery. There was also an extension along the outer portion of the thigh, and an incision was made from 4 to 2, connecting with the other incision, and a similar procedure was carried out. The region in the groin was skin-grafted with Thiersch grafts about ninety days after the original operation. About half of the grafts "took," and the rest of the wound healed rather rapidly. There is now no contraction, and the patient has good use of his leg.

The patient made a somewhat stormy and slow convalescence and received two other transfusions of blood. A large collection of pus formed in the lower posterior part of the thigh and was opened and drained. Eventually the wound in the groin, where the excision of skin had been most extensive, was grafted with Thiersch grafts, and finally, June 22, the sinus in the thigh was injected with Beck's paste. The wound healed and the patient's general condition improved. He was discharged from the hospital, July 19. In November, 1931, he reported his health as excellent.

This case affords an instance of a fulminating type of symbiotic infection in which, for some reason, owing to the weak resistance of the host, the virulence of the bacteria, or a combination of these factors, the infection was almost overwhelming. Cultures from the wound after the first operation showed short chain streptococci and some staphylococci. A smear showed short chain streptococci. Blood cultures were negative. Two months later, when the wound was still suppurating, bacteriologic examination showed as the predominating organisms streptococci, diplococci and Alcaligenes bookeri. In addition there were gram-positive cocci, staphylococci, gram-positive bacilli and gram-negative bacilli. May 8, F. W. Shaw, professor of bacteriology of the Medical College of Virginia, found staphylococci, Alcaligenes bookeri and Bacillus proteus.

COMMENT ON CASES

In the last case the infection apparently did not start from a wound of any kind. It extended rapidly, overwhelming the patient with toxins and showing a marked affinity for the subcuticular fascia and skin such as is found in the typical cases of progressive gangrenous ulcer of the abdominal wall. The main differences seem to have been the virulence and rapidity of the infection. There was no time for actual ulceration with distinct margins. In this case, however, so overpowering was the infection that the use of the cautery alone would probably not have been successful without the continuous intravenous injection of 5 per cent dextrose in Ringer's solution, continued for several days.[14]

In the second case, the bacteriologic examination, together with the other features of the case, would strongly suggest a symbiotic infection somewhat of the nature that Meleney has demonstrated experimentally. On account of the numerous types of bacteria, however, it seems probable that there was a symbiosis of a third element which could cause an invasion of the muscles and fascia of the abdominal wall, ordinarily resistant to the two symbiotic bacteria of Meleney, and could produce, in addition to the destruction of the fat and skin, a complete destruction of the whole abdominal wall. The fact, however, that in the third case the infection showed marked affinity for the same tissues that are affected in the progressive gangrenous ulceration of the abdominal wall (subcutaneous fat, fascia and skin) would suggest an extraordinary virulence of the same bacteriologic factors. Many of these suggestions cannot be definitely proved, but from the premises that we have and from the facts at hand they seem highly probable.

14. Horsley, J. S., and Horsley, G. W.: Continuous Intravenous Injection of Dextrose in Ringer's Solution, Arch. Surg. **22**: 86-93 (Jan.) 1931.

PRINCIPLES OF TREATMENT

The treatment of these cases is the hot cautery. In extensive areas such as in case 3, where the infection was progressing rapidly and was overwhelming, and where it is inadvisable to attempt to excise all the tissue, the lesion can be exposed with the endotherm knife and the tissue then dissected out or thoroughly cauterized with the hot cautery. In no instance should the scalpel be used. The use of the cautery in cases in which there is much pain is followed by marked relief of pain, which is striking.

The therapeutic action of the hot cautery is probably due not solely to the excision of the affected tissue, because if such an excision were done as for malignant tumors it would be necessary to remove at least a good portion of the aponeurosis of the abdominal wall and probably some of the muscle; for it has been shown that the streptococcus, which is the dominant element in this bacterial symbiotic relationship, penetrates beyond the apparently affected tissue.

The case of Probstein and Seelig is interesting in this connection. A typical gangrenous ulcer followed an operation on the mammary gland and resisted treatment for several months while numerous therapeutic remedies, both local and general, were unavailing. Finally the disease was checked after transfusions from donors who had been vaccinated with attenuated bacteria taken from the ulcerative lesion.

In these cases in which the cautery is used it seems not only that the lymphatics and smaller blood vessels are closed by the cautery and these avenues of extension eliminated but also that a definite autogenous vaccine is formed. After a thorough application of the hot cautery there may be considered to be, roughly, three zones of tissue: one in immediate contact with the cautery in which all cells and bacteria are destroyed and disintegrated; a second zone, blending with this, in which the bacteria and tissue cells are probably killed but not disintegrated; and a third zone, external to the second, in which the bacteria are largely attenuated and possibly a few killed. This makes an ideal condition for an autogenous vaccine, and the prompt recovery and checking of the disease after a thorough application of the cautery could be attributed to this action. The treatment, then, that is strongly indicated for this symbiotic infection is the hot cautery, with the endotherm knife as an adjuvant, if necessary. In addition, continuous intravenous injection of dextrose in Ringer's solution is most helpful, and in the overwhelming fulminant type with shock, such as case 3, it is essential. In the other cases, of a milder type, it is also indicated.

Frank P. Underhill of New Haven has shown that the chief danger after burns is the loss of fluids and the electrolytes of the body. These are supplied readily without pain by the intravenous method. Dextrose solution, given in addition to the water and the electrolytes, is a decided improvement in the therapy. It has been shown by McNealy and Willems [15] and others that dextrose is not absorbed through the large bowel. It is difficult to utilize the stomach and small intestines for the absorption of a sufficient amount of water, and the intravenous method offers an excellent medium for furnishing nutrition, water and electrolytes at a minimum of discomfort to the patient and at as rapid a rate as the patient can stand.

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15. McNealy, R. S.: Personal communication to the author, Feb. 8, 1930. McNealy, R. S., and Willems, J. D.: The Absorption of Glucose from the Colon, Surg., Gynec. & Obst. **49**: 794 (Dec.) 1929.

RECENT ADVANCES IN KNOWLEDGE OF SCURVY AND THE ANTI-SCORBUTIC VITAMIN

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During the past decade the advance in our knowledge of the antiscorbutic vitamin and of experimental and clinical scurvy has not been great; it has been far less, for example, than that of vitamin D or of the vitamin B complex, which is composed of the other water soluble vitamins. In the course of this period, we have gained, however, a much clearer understanding of the antiscorbutic foods, particularly in their relation to various processes and manipulations to which they are subjected in the course of merchandising.

PATHOLOGY OF SCURVY

In the field of pathology, great stress has been laid on the changes in the teeth. As early as 1919, it was shown by Zilva and Wells [1] that radical alterations in tooth structure could be brought about in guinea-pigs and in monkeys by a deficiency of the antiscorbutic vitamin. The lesions were in the nature of a fibrosis or a fibroid degeneration of the pulp. These early observations have been extended and have been made the basis of broad clinical deductions in regard to the etiology and incidence of caries. In 1924, Hoejer [2] of Stockholm published a report from Jundell's clinic which showed the possibility of making an early diagnosis of scurvy in guinea-pigs from the histologic examination of the teeth. He demonstrated, by means of convincing illustrations, that definite lesions of the teeth developed as early as the second week after the animals had been placed on a ration highly deficient in vitamin C. The characteristic and primary change he believed to be a development of active osteoblasts from normal active odontoblasts, with the consequent formation of bone in place of dentin. Early involvement of the teeth has also been emphasized by Wolbach and Howe [3] and by Meyer and McCormick [4] in their studies on scurvy, and their stand has likewise been supported by convincing illustrations. The dental lesions in scurvy will be referred to again in connection with a consideration of the newer symptomatology of this disorder.

One aspect of the pathology of scurvy to which particular attention has been devoted during the past few years is the changes in the vessels. In 1921, it was suggested that a "failure of the integrity of the epithelium of the blood vessels" occurred and that "this was due to a lesion of the endothelial cells or their cement substance." [5] A few years later, Wolbach and Howe [3] showed that the defect in the capillaries results from a failure of the endothelial cells to form cement substance and they concluded that the essential pathologic alteration in scurvy is "an inability of the supporting tissue to produce and maintain intercellular substances." They further maintained that this nutritional defect held true not only for the blood vessels but also for the connective tissue of various organs of the body, including the teeth. In the latter

1. Zilva, S. S., and Wells, F. M.: Changes in the Teeth of the Guinea-Pig Produced by a Scorbutic Diet, Proc. Roy. Soc., series B **90**: 505, 1919.
2. Hoejer, Axel: Studies in Scurvy, Acta paediat. (supp.) **3**: 8, 1924.
3. Wolbach, S. B., and Howe, P. R.: Intercellular Substances in Experimental Scorbutus, Arch. Path. & Lab. Med. **1**: 1 (Jan.) 1926.
4. Meyer, A. W., and McCormick, L. M.: Studies on Scurvy, Stanford University, Calif., Stanford University Press, 1928.
5. Hess, A. F.: Newer Aspects of Some Nutritional Disorders, J. A. M. A. **76**: 693 (March 12) 1921.

they noted, on the addition of an antiscorbutic to the dietary, a change in intercellular substance from a liquid to a solid or a jell state.

Meyer and McCormick included an examination of the nervous system in their studies and found degenerative changes in the peripheral nerves and degenerative changes in the large motor cells of the anterior horn. This is the only study that has included the nervous system in its scope and is therefore of particular interest. The only report of pathologic changes of the nervous system in human scurvy is one that I [6] published in 1918, on focal degeneration of the lumbar cord in a case of infantile scurvy. It is highly desirable, from a pathogenic point of view, that further investigation be made regarding involvement of the nervous system, both in experimental and in human scurvy.

SYMPTOMATOLOGY

In regard to symptomatology it was hardly to be expected that much new data would be forthcoming, but it was to be anticipated that endeavors would be directed toward a recognition of the earliest symptoms of the disorder, of the condition designated as "latent scurvy." [7] This clinical condition has also been termed "praeskorbut," a designation which is not pertinent as it conveys the impression that the nutritional disturbance is of a nature different from scurvy. In connection with latent scurvy the greatest importance must be attached to the assertion that dental caries is the outstanding sign of this type of the disorder. As is well known, Hanke [8] and others believe that the distinctive sign of a deficiency of the antiscorbutic vitamin is caries of the teeth; in fact, that this widespread dental disorder is due mainly to a lack of vitamin C in the dietary. Accordingly, they advise that the daily dietary should include a pint of orange juice and the juice of one lemon, as well as lettuce and cabbage. In my opinion, these deductions are far too sweeping and are not supported by the geographic distribution of dental caries or by a study of individual cases, which all indicate some other dominant etiologic factor.[9]

ASSOCIATION OF SCURVY WITH INFECTIONS

Another point that has been brought into prominence in connection with adult as well as infantile scurvy is its intimate association with the infectious process. In 1917 I [10] stated that "one of the striking and important symptoms of scurvy is a susceptibility to infection (furunculosis, nasal diphtheria, grippe, etc.)." In this connection it may be mentioned that nasal diphtheria was noted among a group of scorbutic infants in spite of the fact that many of them gave a negative Schick reaction. Findlay,[11] attacking the problem from an experimental standpoint, showed that guinea-pigs which suffered from chronic scurvy and showed but few clinical symptoms manifested a decreased resistance to bacterial infection; this he attributed to degenerative changes in the bone marrow. About this time Cramer and Kingsbury [12] emphasized the importance of vitamin A in warding off infections, associating this susceptibility with a decrease in the number of platelets of the blood. Abels,[13] in a monograph on scurvy, stressed this relationship of the scorbutic state to infection, giving the name "dysergie" to the nutritional disturbance which occasions the heightened susceptibility. Recently, Minot and his colleagues [14] came to the conclusion that adult scurvy can be precipitated by infectious processes; in other words, that latent scurvy can by this means be changed to manifest scurvy. In general, therefore, investigations in the laboratory as well as clinical observations are in agreement in stressing the interrelationship of scurvy and bacterial infection.

THE CAPILLARY RESISTANCE TEST

The involvement of the blood vessels in scurvy has been stressed in connection with the newer pathology of this disorder. A clinical application of this pathologic condition is the "capillary resistance test" introduced by Hess and Fish [15] in 1914. This is a test of the ability of the small blood vessels to withstand increased intravascular pressure, which is brought about by means of a tourniquet applied to the arm. Clinical studies of this aspect were published by Meyer [16] in 1923, by Öhnell [17] in 1928 and by Goethlin [18] in 1931. The title of the latter paper, "A Method of Establishing the Vitamin C Standard and Requirements of Physically Healthy Individuals by Testing the Strength of their Cutaneous Capillaries," indicates the author's extreme point of view. He found that in Sweden, during April and May, the school children in some country districts gave a positive "capillary resistance test" in 18 per cent of the cases. In my experience there are decided individual variations in regard to the reaction to this test, so that although it is true that petechial spots are far more numerous in individuals suffering from latent or active scurvy, the reaction cannot be used as evidence of a deficiency in vitamin C intake. Occasionally edema rather than hemorrhage has been found in the scurvy of adults and of infants. The cause of these extravasations, which have been noted most often at the ankles, is not known. It would seem most likely that it is associated with a retention of sodium chloride.

INVOLVEMENT OF THE NERVOUS SYSTEM

In infantile scurvy there are definite clinical evidences of an involvement of the nervous system, more particularly of the vagus, as manifested by excessive rapidity of the pulse and of the respirations, symptoms that yield promptly on the addition of antiscorbutic food to the dietary. In 1925, Stewart [19] reported the neurologic symptoms of 150 cases of scurvy which he had observed during the World War. He recorded various indications of sensory disturbances—paresthesia of several forms, pain, hyperalgesia, patchy anesthesia on one or both legs which were symmetrical in a few cases, knee jerks which were

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7. Hess, A. F.: Subacute and Latent Scurvy: The Cardiorespiratory Syndrome (A New Sign), J. A. M. A. **68:** 235 (Jan. 27) 1917.
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11. Findlay, G. M.: The Relation of Vitamin C to Bacterial Infection, J. Path. & Bact. **26:** 1 (Jan.) 1923.
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14. Mettier, S. R.; Minot, G. R., and Townsend, W. C.: Scurvy in Adults, J. A. M. A. **95:** 1089 (Oct. 11) 1930.
15. Hess, A. F., and Fish, Mildred: Infantile Scurvy: The Blood, the Blood Vessels and the Diet, Am. J. Dis. Child. **8:** 386 (Dec.) 1914.
16. Meyer, L. F.: Die skorbutische Diathese, Monatschr. f. Kinderh. **25:** 454 (March) 1923.
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19. Stewart, R. M.: The Clinical Features of Scorbutic Neuritis, J. Neurol. & Psychopath. **6:** 191 (Nov.) 1925.

exaggerated or absent. This is the most complete clinical report of nervous involvement in scurvy.

FOODS

Until about fifteen years ago the accepted dictum in regard to the relation of foods to scurvy was that a diet of dried or of canned foods led inevitably to the development of the disorder. This opinion, which was accepted and cited by medical authorities as well as by laymen, was based largely on the sad experiences which had been encountered with these foods in the rationing of armies and in the navy and mercantile marine. For a short time during the World War it was thought in this country that this deficiency had been overcome by means of dried vegetables, and, accordingly, drying plants were established for vegetables in various parts of the United States, more particularly in California. It was not long, however, before these establishments were discontinued, as it was shown that the dried product was highly deficient in the antiscorbutic factor. The failures were due to the fact that the desiccating process was carried out too slowly and in the presence of atmospheric oxygen, rather than that the foods were exposed to a degree of temperature which was destructive. In eastern Europe dry leguminous pulses, more particularly peas, were steeped in water and allowed to sprout, and the sprouts were used successfully as an antiscorbutic food for troops. It is of interest that Harden and Zilva [20] showed that the antiscorbutic activity is acquired after the steeping process and before germination comes about.

Great progress has been made in regard to preserving the vitamin potency of canned foods. In 1918 it was shown that canned tomatoes retain by far the major part of their antiscorbutic vitamin [21] and, a few years later, that dry milk, milk that had been quickly dried by the roller process, had lost but little of its scurvy protective quality. These results were surprising, especially in respect to dry milk, a product which had been subjected not only to drying but to canning and also to aging. Soon thereafter, I [22] demonstrated that the factor which was destructive to the antiscorbutic vitamin was oxidation rather than heat and that what had been commonly regarded as the damaging effect of high temperature was largely the effect of oxidation. In the application of this principle to commercial canning the careful and consecutive studies of Kohman and Eddy and their collaborators [23] have been most illuminating. Biologic assays of canned foods have been carried out on the guinea-pig, making use of the basal ration which was developed and recommended in 1922 by Sherman, La Mer and Campbell [24] and which has the advantage of being adequate in all nutritional factors with the exception of vitamin C. Without going into detail in regard to the effect of canning on the various vegetables and fruits, each one of which manifests a certain individuality, it may be stated that it is now possible to can these foods with very slight loss of the antiscorbutic factor, provided the process is carried out without subjecting the food to the deleterious effect of oxygen. The technic has even been developed to such an extent that the so-called respiratory oxygen, in other words, the oxygen which is bound within the tissue of the vegetable or fruit, is removed or rendered inert. For example, apples are allowed to stand in salt solution before being processed in order to exhaust their "respiratory oxygen." [23] The high antiscorbutic value of canned tomato juice compared to cabbage juice has been found by Kenny [25] to be due not only to its high acidity but also to its low oxidation potential. Zilva [26] also showed that the citrus fruits can be subjected to astonishingly long periods of heating, provided anaerobic conditions are maintained. For example, little loss of potency came about in decitrated lemon juice after autoclaving at 40 pounds pressure (143 C.) for one hour, and orange juice could be subjected for four hours under high vacuum to a temperature of from 40 to 45 C. (104-113 F.). Dried orange juice also retained almost all its antiscorbutic value. The vitamin C content of the citrus fruits does not vary in potency according to acidity.[27]

There are a few isolated observations made in the course of the many studies of fruits and vegetables which should not be passed by without mention. A recent observation by Zilva [28] shows how variable is the vitamin content of foods and how necessary it is to test not only each food but each variety. For example, quantitative tests showed a remarkable difference between different varieties of apples, one variety assaying at an exceptionally high level. Again, it was demonstrated that green tomatoes ripened by ethylene, a gas which is used considerably for this purpose in commerce, did not lose their antiscorbutic vitamin.[29] In view of the fact that canned pineapple is being used to an increasing extent, it is worth noting that Miller [30] found that the antiscorbutic value of this food is only slightly less than that of the fresh fruit.

There is little to be added in regard to our knowledge of the antiscorbutic potency of milk. As is well known, its potency is dependent entirely on the vitamin content of the food or fodder of the animal. It was therefore of interest and of practical importance from a dairy standpoint to learn from MacLeod [31] that "by including an ensilage of good quality in the ration, the antiscorbutic potency of the milk may be maintained at a high level." Investigations preceding the era which is being considered demonstrated that raw milk contains a moderate quantity of vitamin C and that it loses from one fourth to one third of this factor in the course of ordinary pasteurization. It was also shown that traces of copper bring about rapid destruction of the antiscorbutic vitamin in the course of the heating or pasteurizing process,[32] a result which is due to its

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30. Miller, C. D.: Vitamin C in Fresh and Canned Pineapple, J. Home Econ. **17:** 377, 1925.
31. MacLeod, Florence L.: Antiscorbutic Vitamin Content of Milk of Stall-Fed Cows Throughout a Year, J. A. M. A. **88:** 1947 (July 18) 1927.
32. Hess, A. F.: The Destruction of the Antiscorbutic Vitamin in Milk by the Catalytic Action of Minute Amounts of Copper, Proc. Soc. Exper. Biol. & Med. **19:** 119, 1921. In a paper published in 1762, entitled "That the Use of Copper Vessels in the Navy is One Principal Cause of the Sea Scurvy," Travis (London Medical Observations and Inquiries **2:** 1, 1762) stated: "The number of ships sent to sea from this place is about 200 sail and we employ about 3,000 seamen and boys. On board of these, iron pots are in general use, and we have no instance of any one having the symptoms called highly scorbutic, except on some few of the larger ships on which coppers are used."

catalytic action. Recently, a careful study by Schwartze and his co-workers [33] on the effect of vitamin C content of milk in the presence of certain metals showed that copper and tinned copper were not suitable metals for pasteurizing equipment, whereas aluminum and glass are innocuous. The interesting suggestion was made that anaerobic pasteurization might be of practical value on account of the protective environment which it affords.

THE ANTISCORBUTIC VITAMIN

As stated, the advance in knowledge of the antiscorbutic vitamin has been very slight, especially as compared to the rapid strides that have been made during the past five years in the chemistry of the antirachitic vitamin. In 1921, Bezssonoff [34] carried out a series of experiments with cabbage juice in which he was able to remove some of the active material by means of neutral lead acetate. The main result of his experiments was the development of a specific color test for vitamin C and its recommendation as a substitute for the biologic assay on the guinea-pig. The test substance is essentially the Folin-Denis phenol reagent, but subsequent experience with this reagent has proved it to be unreliable. Some of the most interesting studies in this field have been reported by Zilva and his colleagues [35] at the Lister Institute. They removed the sugar from orange juice by means of fermentation with yeast and then precipitated the vitamin with basic lead acetate. With this concentrate they carried out various physicochemical experiments by means of adsorption and diffusion through collodion membranes of varying permeabilities and were able still further to concentrate the antiscorbutic principle. One of the main results of their work was the demonstration of "a reducing principle" of importance in connection with the activity or inactivity of the antiscorbutic vitamin. They found that this reducing substance exerts a protective action on the vitamin and that when it is removed in the course of chemical fractionation of vitamin C there is a consequent loss of the vitamin; in other words, that this substance protects the vitamin in its natural medium. In another interesting experiment they showed that the addition of autoclaved juice to unheated lemon juice, which had been decitrated by means of calcium carbonate, accelerated the loss of "the reducing principle" and of antiscorbutic activity when the juice was stored at p_H 7. Smith and King [36] have just reported that they prepared an active fraction of lemon juice in which the amount of total solids was 0.09 mg. per cubic centimeter of equivalent of the original juice; in other words, they were able to concentrate the material more than 10,000 times. It is of interest that this fraction showed a reducing value equivalent to that of dextrose.

Nothing could illustrate the sudden and rapid advances which are occurring in the field of vitamin investigations better than the fact that within the past month, in other words, within the period when the foregoing lines were written, a greater advance in our knowledge of the antiscorbutic factor has been reported than throughout the entire preceding decennium. Rygh of Uppsala, and his colleagues,[37] have stated not only that they have isolated vitamin C but that they have been able to synthesize it. Their research started with the conception that, if orange juice was carefully neutralized, it might be possible to extract the active principle from it by means of ether. By this procedure they obtained a considerable amount of crystalline substance which, on further investigation, proved to be the well known mildly toxic alkaloid of opium, narcotine ($C_{22}H_{23}NO_7$). This substance, however, was found to be devoid of antiscorbutic potency. On extracting the juice from unripe oranges they obtained a far greater quantity of narcotine, as much as 600 mg. from 10 liters of juice; as the fruit ripens, the narcotine disappeared. The alkaloid was obtained likewise in large amounts from tomatoes, potatoes and white cabbage but only in small quantity from milk. On irradiating narcotine with the rays from a mercury vapor lamp they developed an active antiscorbutic preparation, which prevented scurvy in guinea-pigs in a daily dosage of about 1 mg., although it failed to prolong life to a marked degree. Furthermore, on making various synthetic products of narcotine they found that several could be elaborated which were antiscorbutic, the most potent being methylnornarcotine, which afforded protection when as little as 0.02 mg. was added to the basal ration. This experimental work has not been substantiated, but it is clear that we are on the threshold of a new era in the realm of experimental scurvy, one which will lead probably to the elucidation of many aspects which have been unsatisfactory and contradictory in the etiology, symptomatology and therapy of this disorder as it is manifested in the experimental animal and in man.

King and Waugh [38] have just reported that, on continuing their experiments with the concentration of vitamin C from lemon juice, they have obtained a substance that is identical with hexuronic acid, which has been found in the suprarenal cortex, cabbage and other sources. Feeding approximately 0.5 mg. daily protected guinea-pigs receiving a diet free from vitamin C. Although this work is too new to have been substantiated, it seems most promising. It is clear that this vitamin is about to be reinvestigated from a biologic and a chemical point of view.

Recently an international conference was held in London to establish uniform standards for the various vitamins. The unit for the antiscorbutic vitamin was laid down as the vitamin C activity of 0.1 cc. of fresh lemon juice of the lemon Citrus limonum. This standardization makes it possible in future to compare investigations and assays in this field which are carried out in laboratories in different parts of the world.

PATHOGENESIS

As usual, pathogenesis presents the greatest difficulty. In this respect the problem is no different for vitamin C than in relation to any other of the vitamins. Although from time to time doubt has been cast on the simple and unalloyed nature of scurvy and of vitamin deficiencies as the underlying cause of the various avitaminoses, little attention has been paid to these doubts and misgivings. In 1917, in a study on the

33. Schwartze, E. W.; Murphy, F. J., and Cox, G. J.: Effect of Pasteurization on the Vitamin C Content of Milk in the Presence of Certain Metals, J. Nutrition **4**: 211 (July) 1931.

34. Bezssonoff, N.: Sur une réaction colorée commune aux extraits antiscorbutique et à l'hydroquinone, Compt. rendu Acad. d. sc. **173**: 466, 1921.

35. Zilva, S. S.: The Antiscorbutic Fraction of Lemon Juice, Biochem. J. **21**: 689; Hoyle, Edward; and Zilva, S. S.: Ibid. **21**: 1121, 1927. Zilva, S. S.: Ibid. **23**: 1199, 1929.

36. Smith, F. L., and King, C. G.: The Preparation and Storage of Vitamin C Concentrates from Lemon Juice, J. Biochem. **94**: 491 (Dec.) 1931.

37. Rygh, Ottar; Rygh, Aagot; and Laland, Per: Chemische Untersuchungen über das antiskorbutische Vitamin: I. Laland, Per: Versuche zur Isolierung des Narkotins aus verschiedenen Vegetabilien. Rygh, Ottar; and Rygh, Aagot: Chemische Untersuchungen über das antiskorbutische Vitamin: II. Ueber Narkotin und dessen Abkömmlinge als Antiskorbutica, Ztschr. f. physiol. Chem. (Hoppe-Seyler's) **204**: 105, 112, 114, 1932.

38. King, C. G., and Waugh, W. A.: The Chemical Nature of Vitamin C, Science **75**: 357, 1932.

pathogenesis of scurvy, I [10] made the following statement: "Infantile scurvy is not, however, a simple dietary disease. The diet is at fault in allowing the intestinal bacteria to elaborate toxins. It is doubtful whether the toxin is always the same and therefore whether strictly, from an etiologic standpoint, this disorder should be regarded as an entity." Whether this point of view requires modification will depend on subsequent investigations, but in the main it would seem to accord with clinical and experimental observations. Some recent work by Kollath and his colleagues [39] is of interest in this connection. In the first place, they corroborated McCollum's observation that, although polyneuritis is induced in rats as the result of a scorbutic diet, the pathologic lesions of the bones are those of scurvy. They showed, furthermore, that without any basic change in the dietary they could induce scurvy or beriberi at will. By incorporating peanut oil instead of cottonseed oil in the ration they were able, for the first time, to bring about, in rats, clinical scurvy associated with multiple hemorrhages, and were able to change this result and induce beriberi in the majority of the animals merely by adding alkaline hematin to the dietary. This change they attribute to an oxidation within the intestine of the unsaturated fatty acids of the peanut oil, brought about by the catalyzing action of the hematin. They believe that beriberi and scurvy have a common metabolic cause and that the vitamins are merely of relative importance—whether the one or the other disorder develops, depending on minor deficiencies in the dietary or on harmful additions. These results in animals recall a clinical observation made several years ago by Darling [40] that among some African Negroes a diet that caused scurvy in one set of men caused neuritis in others. They accord also with clinical experience in regard to the unaccountable irregularities in the course of scurvy. Scurvy may fail to recur although the diet is the same as that which led originally to the disorder.

In connection with these considerations it is probably not without significance that a diet which causes scurvy in the guinea-pig leads to polyneuritis in the fowl, and that of two herbivora as closely related as the guinea-pig and the rabbit, the former is extremely sensitive to scurvy whereas the disorder can be induced in the latter only with the greatest difficulty. It may be added that Hauge and Carrick [41] have noted that, although the egg of the hen does not contain vitamin C, chicks develop normally without the addition of this vitamin to their ration. They attribute this to a synthesis of the nutritional factor.

INCIDENCE OF SCURVY

During the War, scurvy increased in infants and adults among both the military and the civilian population, but during the past decade it has been no more frequent than in prewar times. In Leningrad, however, in a three year period ending in 1924, 186 cases of scurvy were observed in the children's clinic, and the mortality was 16 per cent.[42] In New York City cases are exceptional, for it has become almost routine to include orange juice or tomato juice in the dietary of the infant, and adults partake of potatoes, fruit or vegetables throughout the year. Economic conditions have, however, always had an effect on the incidence of scurvy, and it is quite possible, if not probable, that the economic depression in this country and abroad may entail an increase in latent and manifest scurvy in adults as well as in infants.

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39. Kollath, Werner: Zur Pathogenese der Avitaminosen, Klin. Wchnschr. **10**: 1841 (Oct. 3) 1931.
40. Darling, S. T.: The Pathologic Affinities of Beriberi and Scurvy, J. A. M. A. **63**: 1290 (Oct. 19) 1914.
41. Hauge, S. M., and Carrick, C. W.: The Antiscorbutic Vitamin in Poultry Nutrition, Poultry Science **5**: 166, 1926.
42. Schagan, B.: Zur Klinik des Skorbutes im Kindesalter, Jahrb. f. Kinderh. **104**: 225 (Feb.) 1924.

PAINLESS JAUNDICE

ITS DIFFERENTIAL DIAGNOSIS BY THE GALACTOSE TOLERANCE TEST

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The difficulties encountered in any functional test studies are particularly accentuated in those concerned with the liver. This is largely due to the fact that nature has entrusted to the liver a multiplicity of functions not equaled by any single organ. These numerous activities, widely dissociated in character, give rise to the necessity for the many liver tests that have been devised. The application of these tests is beset with further difficulties dependent on the peculiar physiologic activity of the liver. The continued functioning of this organ being vitally necessary,[1] it has been endowed with an adequate reserve [2] and a markedly high regenerative capacity. Some idea of the regenerative ability of the liver cells may be obtained from the experiments of Mann and Bollman,[3] who found that the removal of 70 per cent of the liver of the normal dog was followed in a few weeks by regeneration of the remaining 30 per cent to approximately the preoperative level. It is these factors which offer the greatest difficulty both in the experimental production of chronic hepatic insufficiency and in the evaluation of function tests in clinical chronic hepatic damage. If one adds to the aforementioned difficulties the problems of the utilization of sugars by the tissues, the rôle of the endocrines in sugar metabolism, the inaccuracy of chemical methods for the determination of various sugars in the blood, and the relation of the kidney threshold to sugar excretion, one can appreciate a few of the pitfalls that have hindered attempts to study the carbohydrate function of the liver as a measure of that organ's activity.

The discovery of the carbohydrate function of the liver by Claude Bernard stimulated many attempts to utilize that function as a measure of the liver's working capacity. The resulting controversy between the German and the French schools during the latter part of the last century left this problem in a very doubtful state of utility. Interest was reawakened, however, by the work of Strauss [4] in 1901, in which levulose was introduced as an hepatic test substance; the conflicting opinions of other observers were reconciled on the basis of the variations in types and amounts of the test sugars previously used, and the levulose tolerance test has undoubtedly remained the favorite among the carbohydrate function tests of the liver.

From the Gastro-Intestinal Clinic of the Jewish Hospital.
Read before the Pan American Medical Congress, Mexico City, July 29, 1931.

1. Mann, F. C.: Modified Physiologic Processes Following Total Removal of the Liver, J. A. M. A. **85**: 1472 (Nov. 7) 1925.
2. Rous, Peyton; and McMaster, P. D.: The Liver Requirement of the Fasting Organism, J. Exper. Med. **39**: 425 (March) 1924.
3. Mann, F. C., and Bollman, J. L.: Liver Function Tests, Arch. Path. & Lab. Med. **1**: 681 (May) 1926.
4. Strauss, H.: Zur Funktionsprüfung der Leber, Deutsche med. Wchnschr. **27**: 757, 1901.

In this paper, however, we are concerned with the galactose tolerance test, a test suggested by Bauer [5] of Vienna five years after the introduction of levulose. In a previous publication we [6] indicated the superiority of galactose over levulose as a test substance, and some of the earlier evidence [7] indicating that levulose is absorbed almost specifically by the liver must be discarded in the light of recent investigation.[8] Bollman and Mann have revealed the capability of the stomach and intestine for converting levulose into dextrose, a fact which practically invalidates the use of levulose for testing liver function.

Some four years ago, we [9] undertook to study the clinical value of the galactose tolerance test. Certain basic facts regarding the metabolism of this sugar, however, required elaboration before the urinary output could be used as a measure of its utilization. Our [6] preliminary work with this sugar, coupled with the observations of other investigators, convinced us that galactose, after its absorption from the intestine, is carried by the portal circulation to the liver, where, at any one time, it is utilizable in amounts ranging between 37 and 40 Gm.; that, failing utilization by the liver, the galactose reaches the general circulation, where it is practically unavailable as a source of energy for any of the other tissues, regardless of the state of the endocrine glands; further, that there is no renal threshold for galactose such as there is for dextrose and fructose. There is, therefore, complete elimination in the urine of any galactose which fails to be utilized by the liver, thus justifying the use of the urinary excretion of this sugar as a measure of its utilization by the liver. In brief, galactose is a sugar that is ideally suited to test the carbohydrate function of the liver.

TECHNIC OF GALACTOSE TOLERANCE TEST

After an overnight fast, the patient is given exactly 40 Gm. of galactose. This is usually administered in two glasses of water (approximately 500 cc.) and may be flavored with a few drops of lemon juice. During the five-hour period of the test, the patient may drink as much water as desired in order to insure full elimination of any nonutilized sugar, but is permitted to ingest absolutely nothing else. Specimens of urine are collected at hourly intervals for five hours, care being exercised to secure the total amount of urine voided during the entire test period. When the test is completed, the total quantity of urine is measured and mixed; estimation of the amount of sugar present is determined according to the Benedict quantitative method, and the total amount of sugar excreted during the period of the test is calculated. In diabetic patients a special technic [9] is employed to separate the dextrose from any galactose excreted.

INTERPRETATION OF RESULTS

From the tolerance figures already given, it is obvious that a normal individual may excrete from 0 to 3 Gm. of galactose after the ingestion of 40 Gm. of that sugar. These are the figures set by Bauer and those accepted by us as representing the normal range of excretion during the five hours of the test period. From our studies, we believe that the 3 Gm. limit is the safer one to adopt, although others (Neugebauer,[10] Maliwa,[11] Reiss and Jehn,[12] and Wagner [13]) have adopted lower limits of excretion for normality. Accepting, then, the 3 Gm. excretion as the extreme for normal, we shall show the effect of hepatic damage on this limit.

The vital necessity of the carbohydrate function of the liver for the animal economy has been adequately demonstrated by Mann and Magath.[14] The degree of reserve and protection for this function has been indicated. It is obvious that mild or local damage leaving an adequate reserve, or chronic damage permitting time for regeneration of the liver cells, would not affect this function of the liver. This is precisely the case, and in these types of hepatic injury the galactose tolerance test gives the same results as in normal cells. However, when the liver cells are acutely and diffusely damaged, as in a toxic or infectious process, the carbohydrate function of the liver is impaired, and, as a result, amounts of galactose greater than 3 Gm. are excreted in the urine in the five hours following the ingestion of 40 Gm. of that sugar. Since this type of liver cell damage is frequently accompanied by jaundice, this test finds its greatest usefulness in differentiating the toxic or infectious jaundice from the obstructive and hemolytic types.

On account of the high normal level which we use, we are occasionally concerned about the interpretation of readings which closely approach the 3 Gm. output. Experience has taught us that readings which are even but slightly above 3 Gm. may confidently be placed in the toxic or infectious group. Readings between 2.5 and 3 Gm. cause the greatest concern in classification. While, in our experience, cases of obstructive jaundice rarely give readings falling within these higher levels, occasional instances occur; difficulty then arises in separating these from the toxic jaundice group, which, in its earliest or its declining stages, may give readings below 3 Gm. Differentiation may be made, however, by repeating the tolerance test at intervals of from two to three days for a week. The high normal readings may be encountered in toxic jaundice either during the ascent or during the decline of the liver cell damage. During the ascent of the damage, readings of less than 3 Gm. may be obtained before the injury has progressed to the point of interference with the carbohydrate function of the liver. During the decline or repair of the hepatic damage, the high normal readings may be obtained after the peak of injury has been reached and the regenerative ability has become operative to such an extent that this vital function has recovered in part or in toto. In either case, a repetition of the test will clarify the situation. In cases of increasing damage, the subsequent readings will be over 3 Gm.; in those showing recovery, the subsequent readings will be further diminished while the jaundice is decreasing. The latter will be evidenced early by a

5. Bauer, R.: Ueber die Assimilation von Galaktose und Milchzucker beim Gesunden und Kranken, Wien. med. Wchnschr. **56**: 20, 1906.

6. Shay, Harry; Schloss, E. M., and Bell, M. A.: The Metabolism of Galactose: I. Considerations Underlying the Use of Galactose in Tests of the Function of the Liver, Arch. Int. Med. **47**: 391 (March) 1931.

7. Sachs, H.: Ueber die Bedeutung der Leber fur die Verwerthung der verschiedenen Zuckerarten im Organismus, Ztschr. f. klin. Med. **38**: 87, 1899. Blumenthal, F.: Zur Lehre von der Assimilationsgrenze der Zuckerarten, Beitr. z. chem. Physiol. u. Path. **6**: 329, 1904.

8. Bollman, J. L., and Mann, F. C.: Studies on the Physiology of the Liver: XIX. The Utilization of Fructose Following Complete Removal of the Liver, Am. J. Physiol. **96**: 683 (March) 1931.

9. Shay, Harry; Schloss, E. M., and Rodis, Isadore: II. The Galactose Tolerance Test in the Differential Diagnosis of Jaundice, Arch. Int. Med. **47**: 650 (April) 1931.

10. Neugebauer, H.: Zur Pathogenese des Icterus Catarrhalis, Wien. klin. Wchnschr. **25**: 514, 1912.

11. Maliwa, E.: Bemerkungen zur Galaktose Intolerans, Med. Klin. **18**: 762, 1922.

12. Reiss, E., and Jehn, W.: Alimentare Galaktosurie bei Leberkrankheiten, Arch. f. klin. Med. **108**: 187, 1912.

13. Wagner, F.: Klinische Untersuchungen ueber die Bedeutung der verschiedenen Zuckerproben für die Beurteilung der Leberfunktion, Ztschr. f. klin. Med. **80**: 174, 1914.

14. Mann, F. C., and Magath, T. B.: Studies on the Physiology of the Liver: II. The Effect of the Removal of the Liver on the Blood Sugar Level, Arch. Int. Med. **30**: 73 (July) 1922.

diminishing blood and urinary bilirubin, the appearance and rapid increase of urinary urobilinogen and the return of normal color to the stools. On the other hand, in the case of an obstructive type of jaundice with a high normal output of galactose, the tolerance test will show, on repetition, either no change or a lowered output, while the jaundice is stationary or increasing; we have never obtained readings above 3 Gm. in such instances.

In this paper we wish to stress particularly the painless jaundice group, a considerable source of worry to the clinician. This includes the jaundice seen past 35 or 40 years of age, the jaundice that might inadequately be classified as occurring in the cancer age period. It is this group that not only taxes the diagnostic acumen of the keenest clinicians in attempting to arrive at a proper etiologic diagnosis but also demands such a diagnosis early, if effective treatment is to be instituted. The common etiologic factors concerned in this group are the so-called catarrhal jaundice, silent stone in the common duct, carcinoma of the head of the pancreas, or chronic pancreatitis involving this region. The determination of the correct etiology in such a case is evidently of vital importance in revealing the prognosis and directing the therapy. Should the patient be operated on early, as in the case of carcinoma of the head of the pancreas or chronic pancreatitis, and spared the danger of hemorrhage in a late operation? Should operation be delayed, as in the case of stone in the common duct, in the hope that the obstruction may be relieved, the jaundice cleared up and the operative risk considerably lessened? Or, is operation absolutely unnecessary and a serious mistake? These are the vitally important questions falling on the clinician early in this group of painless jaundice. It is in these diagnostic dilemmas that the galactose tolerance test becomes of paramount importance. While it does not determine any specific etiology, it is, in our experience, the only positive means of identifying toxic or infectious jaundice early in its course. The duct stone group, in turn, can best be identified by examination of the bile obtained by nonsurgical biliary drainage, as previously indicated by us.[15]

Thus we have a ready means of separating an important and difficult group of conditions, all of which present practically identical clinical pictures, a group in which the anatomic diagnosis of the cause of the jaundice is the important factor in determining the prognosis and, particularly, the type of therapy to be employed. The following case reports will illustrate the application of the galactose tolerance test in this group; only the relevant historical and laboratory data are included:

CASE 1.—J. E. H., a woman, aged 54, had been in apparently good health until six days prior to admission, at which time she suddenly became nauseated, and persistent, intermittent vomiting developed. Three days after the onset, the family physician noticed jaundice, although the patient had previously noted the light yellow color of the stools and the increasingly dark color of the urine. The appetite, previously good, fell off; there was no history of past gastro-intestinal symptoms, excepting a slight attack of indigestion four weeks previously, lasting about a day, attributed to some food eaten. There was no constipation, no weight loss and no pain. Aside from a slightly enlarged, smooth liver, nothing was made out on physical examination. Two capable clinicians who saw the patient at this time were of the opinion that this was a catarrhal jaundice. The day following admission, the galactose tolerance test yielded an output of 1.3 Gm.; the van den Bergh reaction was: direct, immediate; indirect, 13.5 units. The result of the galactose test pointed definitely to an obstructive type of jaundice, and not to a hepatitis. Operation revealed a carcinoma of the gallbladder.

CASE 2.—J. F., a woman, aged 54, complained of nausea, which had developed four months prior to the present illness and which was particularly aggravated by the sight or smell of any of the cooked vegetables. This symptom continued two or three weeks, after which she felt perfectly well, until one week before admission. At this time nausea returned, but there were no other symptoms except a violent dislike for coffee, of which she was in the habit of taking four or five cups daily. There had been a weight loss of 8 or 9 pounds (approximately 4 Kg.) in the past six months. With the return of the nausea, she noticed a change in color in the urine and stools, as well as a slight yellow tinge to the skin. On admission, she had all the clinical manifestations of a well marked obstructive jaundice. There had been no pain at any time. Physical examination was negative except for some enlargement of the liver and a questionable enlargement under the right costal margin which was suspected of being an enlarged gallbladder. The galactose tolerance test, however, yielded an output of 3.46 Gm., pointing definitely to a toxic hepatitis. The van den Bergh test was: direct, immediate; indirect, 21 units. The patient made an uneventful recovery in the course of about six weeks and has been in perfect health since, nearly a year having elapsed.

Case 3 illustrates the application of the test in the presence of diabetes:

CASE 3.—F. S., a woman, aged 52, had diabetes for at least four years. The present illness dated back four weeks, when she began to feel weak; during that period of time she lost 12 pounds (5.4 Kg.); she did not suffer any pain. Two weeks prior to admission, generalized itching of the skin developed, and one week later, jaundice, dark urine and light stools. The physical examination gave negative results.

The fasting blood sugar was 272 mg. per hundred cubic centimeters, and the urine contained 1 per cent of sugar. The direct van den Bergh reaction was immediate; the icteric index was 55. The galactose tolerance test yielded an output of 10.1 Gm., which after fermentation to eliminate the dextrose content of the urine gave a reading of 8.1 Gm. for the galactose output. One week later, repetition of the galactose tolerance test yielded an output of 3.4 Gm. before fermentation and 2.37 Gm. of galactose after. The patient made an uneventful recovery from her catarrhal jaundice in about five weeks.

Case 4 illustrates the fact that long-standing chronic hepatic damage fails to effect the carbohydrate tolerance of the liver:

CASE 4.—H. K., a woman, aged 50, presented a deep, painless jaundice of nine months' duration, which, at operation, proved to be a chronic pancreatitis. On two occasions the galactose tolerance test yielded outputs of 1.1 and 0.3 Gm., respectively, in the five-hour periods after the ingestion of 40 Gm. of that sugar. In this instance, liver cell regeneration was doubtless compensating for the damage accruing from the long-standing obstructive jaundice.

CONCLUSIONS

The instances cited are merely used to illustrate how the galactose tolerance test may be applied in the differential diagnosis of painless jaundice. The data have been limited to the demonstration of this test, and other laboratory data have been purposely omitted since they added nothing in clarifying the diagnosis.

The galactose tolerance test is a simple, ready means of identifying a clinically difficult group of cases,

15. Piersol, G. M.; Bockus, H. L., and Shay, Harry: The Diagnostic Value of Duodenal Drainage in Gallstone Disease, Am. J. Med. Sc. **175**: 84 (Jan.) 1928. Shay, Harry; Tumen, Henry; and Rodis, Isadore: The Diagnosis of Gallstones: Relative Accuracy of Cholecystography and Nonsurgical Biliary Drainage, M. Clin. North America **13**: 939 (Jan.) 1930. Bockus, H. L.; Shay, Harry; Willard, J. H., and Pessel, J. F.: Comparison of Biliary Drainage and Cholecystography in Gallstone Diagnosis, with Especial Reference to Bile Microscopy, J. A. M. A. **96**: 311 (Jan. 31) 1931.

namely, the toxic or infectious jaundice group, and of separating it from the obstructive type which frequently masquerades in identical symptomatology. Particularly is the latter true in the cases seen in middle and in later life, when the consideration of malignancy is always looming in the foreground. The value of the test is further enhanced by the simplicity of the technic involved.

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ANTITOXIC IMMUNITY RESULTING FROM ADMINISTRATION OF TOXIN BY MOUTH

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The following experiments were made to learn whether or not ingestion of a sterile soluble toxin may stimulate the body to produce the corresponding antitoxin:

Persons were selected who gave no history of an attack of scarlet fever and who were susceptible to the fever streptococci, nose and throat cultures were made on blood agar plates before administration of the toxin was begun. Similar cultures were made at intervals during the course and again at the end of each experiment. The blood agar plates were incubated over night and examined for the presence of hemolytic streptococci. Cases in which hemolytic streptococci of any kind were present were excluded from the series.

In this group there were no reactions attributable to the toxin with the exception of one instance, W. R., who vomited after the third and fourth doses of 8 cc.

The results of oral administration of scarlet fever toxin in these experiments are shown in the table.

The same toxin employed in the foregoing experiments was used to immunize another group of 209 susceptible persons by hypodermic injection of the usual five graduated doses of 500, 2,000, 8,000, 25,000 and 100,000 skin test doses injected subcutaneously at intervals of one week. Administered in this way, the toxin immunized 93 per cent to the point of a negative skin reaction.

CONCLUSION

Ingestion of sterile scarlet fever toxin may stimulate the body to produce the corresponding antitoxin in amounts sufficient to change a positive skin reaction to a negative reaction.

Results of Administration of Scarlet Fever Toxin by Mouth

Case	Age in Years	Original Skin Reaction to One Skin Test Dose of Scarlet Fever Toxin	Amount of Toxin Administered by Mouth	Result of Retest with One Skin Test Dose of Scarlet Fever Toxin
D. M.	3	20 by 25 mm.; bright red	5,200,000 skin test doses in 16 doses	Negative on 16th day
A. H.	5	10 by 10 mm.; faint pink	5,200,000 skin test doses in 16 doses	Negative on 16th day
E. G.	3	28 by 24 mm.; bright red, swollen	5,200,000 skin test doses in 14 doses	Negative on 14th day
P. L.	7	16 by 20 mm.; hemorrhagic	7,200,000 skin test doses in 12 doses	Negative on 12th day
A. P.	12	18 by 19 mm.; moderate red	7,200,000 skin test doses in 12 doses	20 by 14 mm.; faint pink on 12th day
H. C.	9	30 by 16 mm.; moderate red	8,800,000 skin test doses in 16 doses	35 by 22 mm.; very faint on 16th day
R. C.	7	31 by 20 mm.; moderate red	8,800,000 skin test doses in 16 doses	Negative on 16th day
L. D.	9	15 by 12 mm.; very faint	8,800,000 skin test doses in 16 doses	Negative on 16th day
J. K.	10	22 by 20 mm.; moderate red	8,800,000 skin test doses in 14 doses	24 by 8 mm.; faint on 16th day
H. L.	9	12 by 11 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
E. L.	12	18 by 15 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
R. M.	11	31 by 21 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
A. P.	12	32 by 21 mm.; moderate red	8,800,000 skin test doses in 14 doses	11 by 7 mm.; very faint on 16th day
M. R.	5	27 by 17 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
R. R.	7	30 by 20 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
W. R.	10	27 by 18 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
A. R.	8	28 by 20 mm.; moderate red	8,800,000 skin test doses in 14 doses	35 by 20 mm.; very faint on 16th day
M. S.	12	33 by 19 mm.; moderate red	8,800,000 skin test doses in 14 doses	Negative on 16th day
T. S.	12	25 by 20 mm.; bright red	8,800,000 skin test doses in 14 doses	Negative on 16th day

disease as shown by positive skin reactions following intradermal injection of one skin test dose of scarlet fever toxin. Sterile scarlet fever toxin from which the streptococci had been removed by filtration was administered by mouth in doses increasing from 4 cc. to 16 cc. of a toxin containing 50,000 skin test doses per cubic centimeter. Thus the amount of toxin administered in a single dose was increased from 200,000 to 800,000 skin test doses. The toxin was given once a day on successive days. It was taken without dilution and unaccompanied by water or other fluid at least two hours after the preceding meal and not less than one and a half hours before the next meal. After preliminary experiments to establish the harmlessness of the procedure, investigations were continued with the assistance of Dr. John Nichols of Mooseheart, Ill.

The degree of immunity resulting from administration of the toxin by mouth was determined by skin tests repeated from twelve to sixteen days after the first dose of toxin was given.

To exclude the possibility of accidental immunization resulting from coincident infection with scarlet

From the John McCormick Institute for Infectious Diseases.

The fact that when administered by mouth an average total dosage of 8,315,789 skin test doses of toxin immunized 73.1 per cent, while a total of 135,500 skin test doses injected subcutaneously immunized 93 per cent, indicates that toxin administered by mouth is less efficient than the same toxin injected subcutaneously.

Anemia and Disease of the Thyroid.—The thyroid is the only endocrine gland disease of which is attended by anemia. The thyroid was originally in communication with the alimentary canal, and the anemia of hypothyroidism is very similar to the anemias of nutritional and alimentary disease. As we might expect from animal experiments, which show that thyroxin stimulates blood formation, hyperthyroidism per se does not give rise to anemia. But women who develop hyperthyroidism are often of the chronic abdominal invalid type, and many of them have achlorhydria. This probably explains the severe anemias which are occasionally met with in women with hyperthyroidism. Meulengracht observed pernicious anemia 8 times in 151 women with hyperthyroidism; it developed relatively early in life, from seven to twenty-eight years after the onset of hyperthyroidism, and was of moderate severity.—Witts, L. J.: The Pathology and Treatment of Anemia, *Lancet*, March 12, 1932, page 549.

THE CONTROL OF AN OUTBREAK OF SCARLET FEVER

A REPORT

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AND
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Numerous preventive measures, including isolation of the patient and disinfection of skin, throat, clothing, utensils and rooms, have been unsuccesful in the control of scarlet fever outbreaks. Failure may be attributed to ignorance of the etiologic factor and of the epidemiology of the disease. In recent years, knowledge of the pathogenesis of scarlet fever has progressed through advances in bacteriologic and immunologic research.

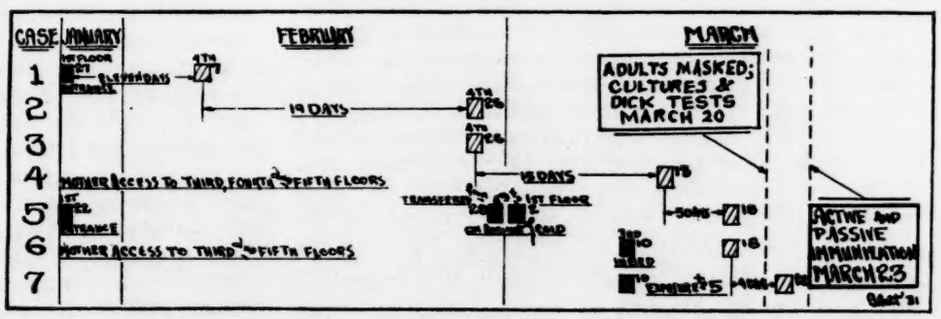
A mass of evidence has accumulated pointing toward a hemolytic streptococcus as the causative agent. The discovery of the production of a specific toxin by Streptococcus scarlatinae and of its antitoxin was reported in 1924 by the Dicks. The application of these discoveries evoked a rational, scientific program for controlling the disease. There is now considerable assurance that epidemics are rapidly and effectively controllable in proportion to the extent of the employment of what is definitely established and known. This knowledge provides a new method of approach to the development of logical procedures.

The contributions of the Dicks form the basis of an immunizing program through their development of (1) a skin test for determining susceptibility to scarlet fever; (2) a method of active immunization of susceptible persons; (3) a specific antitoxin; (4) a method of identifying scarlet fever streptococci, and (5) control of quarantine by means of cultures from the nose, pharynx, ears and discharging sinuses of patients and contacts. In order to be effective, procedures for the control of epidemics apparently necessitate these measures. Practical demonstration of the efficacy of such a program was seen in the widespread Berea College epidemic, brought under control in seven days.[1]

Epidemics occurring in institutions housing children are especially favorable for demonstrating the logic and rationale of these newer practices. In such an environment, an opportunity is afforded for the study of the factors of contagion and immunity as influenced by intimate contact. Such a study was made possible by the occurrence of an outbreak of scarlet fever at the St. Vincent's Infant and Maternity Hospital. This institution provides 170 beds for children under 5 years of age. Five floors are in active clinical use. The ground floor, with forty beds, is used as an observation ward. Newly admitted infants are isolated here two weeks and to this floor sick infants from the upper wards are brought for care and observation. The infants on this floor are segregated in three rooms according to age. There are no cubicles. The first floor contains offices and quarters for the administrative and executive personnel. The second floor contains the obstetric and operating rooms and graduate nurses' quarters. The third floor houses prepartum and postpartum patients, who act as attendants throughout the hospital. The fourth floor contains two large wards and playrooms for children over a year old. An undergraduate school of infant nursing is maintained, and the student nurses are quartered on this floor. The infants under 1 year of age occupy five wards on the fifth floor. All attendants are assigned to wards but are transferred haphazardly as the population of the wards necessitate a change. As soon as a contagious disease is recognized the patient is sent to a contagious disease hospital. St. Vincent's lacks the facilities for proper isolation. Carriers and suspects are cared for temporarily on the ground floor.

The history of the outbreak which is outlined in the accompanying chart, was as follows:

CASE 1.—Lawrence Guss, aged 3 years, entering Jan. 27, 1931, was kept on the ground floor for ten days and then transferred to the fourth floor, ward H, four days before the termination of the established observation period. February 7, eleven days after entrance, he developed fever and was returned to the ground floor. The following day a scar-



Course of outbreak: Solid squares denote date of entrance; cross hatching, date of eruption. Interval between cases is shown in days. Patients 2, 3 and 4 entered the institution prior to Jan. 1, 1931.

latiniform rash appeared and he was isolated and transferred to the Cook County Hospital.

CASE 2.—Raymond Kirchens, aged 2½ years, had been in the institution since Nov. 8, 1929. On Feb. 26, 1931 (nineteen days after possible exposure to case 1), he developed scarlet fever and was sent to ground floor isolation and then to the county hospital.

CASE 3.—Richard Lisek, aged 2 years, had been on the fourth floor, ward H, since Dec. 20, 1930. On Feb. 26, 1931 (same day as patient 2), he too developed scarlet fever.

CASE 4.—Irene Bartz, a mother, aged 22, entered the hospital in September, 1930. Her room was on the third floor with other mothers. She worked on the fourth floor where the previous cases had developed and visited her child on the fifth floor, where infants under 1 year are housed. No case of scarlet fever developed on this floor. March 13 (fifteen days after cases 2 and 3) she developed scarlet fever and was sent to the Municipal Contagious Hospital.

CASE 5.—Charles Barry, aged 14 months, entered Jan. 22, 1931, and was sent to the fourth floor, ward H, February 28. He was sent back to the ground floor March 2, because of an infection of the upper respiratory tract. March 18, he developed scarlet fever (five days after case 4, three weeks after cases 2 and 3 developed, and sixteen days after leaving the fourth floor).

CASE 6.—Aileen Franklin, a mother, aged 19, who entered the hospital, Feb. 1, 1931, roomed on the third floor and worked on the fifth. After March 10, she was confined to bed because of edematous feet. March 18, five days after case 4 developed,

Read before the Chicago Pediatric Society, Oct. 20, 1931.
From the Department of Pediatrics, University of Illinois College of Medicine and St. Vincent's Infant and Maternity Hospital.
1. Jones, J. L., and Armstrong, J. W.: A Practical Demonstration in the Control of Scarlet Fever, Kentucky M. J. 11: 490 (Nov.) 1929.

on the same floor, she developed scarlet fever. She could have been exposed only to case 4 or to some adult carrier.

CASE 7.—Jeanette Falvey, aged 2½ years, who entered the hospital, March 10, 1931, had been playing with patient 5, March 16 and 17. On March 22 (six days after known exposure, and four days after case 5 developed) scarlet fever was diagnosed. Patients 5 and 7 had been intimately associated with at least ten other children on the ground floor, none of whom developed scarlet fever. No other case occurred in the institution.

Case 1 preceded cases 2 and 3 by nineteen days. Cases 2 and 3 preceded case 4 by fourteen days. During this period, one was not impressed with the fact that there was danger of an epidemic. The significance of the long interval between cases was not realized until the fifth developed. Then it appeared probable that adult carriers, having access to more than one floor, were the means of transmission.

Rigid preventive measures were instituted, March 20, two days after the occurrence of cases 5 and 6. Isolation, cultures, masking and Dick tests were started. Masks made of six layers of 18 by 22 inch gauze, large enough to cover the mouth and nose, were used on all adults. Throat cultures on blood agar plates were taken of patients and attendants. Children with positive cultures of hemolytic streptococci were isolated in special wards on their respective floors. Adults with positive cultures were required to remain masked at all times except when eating and sleeping. They were roomed and took their meals as a group; their dishes and linens were boiled after use. The throats of all patients and attendants with positive cultures were swabbed with an antiseptic [2] twice daily and the same solution was instilled into each nostril. The masks were removed and other restrictions discontinued as soon as three negative cultures were obtained. Dick tests were done on every one in the hospital. Three positive Dick tests were found among the children last exposed to cases 6 and 7. These

TABLE 1.—*Results of Dick Tests and Symptoms Subsequent to Active Immunization*

	Children	Nurses	Mothers	Male Attendants	Total
Number	176	30	58	7	271
Dick positive	43	7	11	0	61
Per cent	24	23	19	..	21
Culture positive	23	2	4	1	30
Dick positive after fourth dose	6	..	..	..	..
Dick positive after fifth dose	0	1	0	..	1
Dick positive after sixth dose	..	0	..	..	0
Number immunized	35	7	4	0	46
Fever	18	6	4	..	28
Vomiting	11	2	1	..	14
Sore throat	1	0	1	..	2
Local reaction:					
Mild	21	7	4	..	32
Severe	0	4	2	..	6
Generalized eruption	1	0	0	..	1

children were immediately given prophylactic doses of scarlet fever antitoxin (Dick) followed a week later by active immunization. All other patients and attendants with positive Dick tests were given the five injections of Dick toxin for active immunization, spaced five days apart. March 22, the last case of scarlet fever developed, case 7. The patient had been Dick positive and had not received antitoxin. During the succeeding six weeks, cultures of new patients were taken, Dick tests were made, and identical procedures for immunization instituted.

The immunization of forty-six cases afforded an opportunity to observe the effect of the Dick toxin (table 1). Of 176 children, 43 (24 per cent) were Dick positive; of 30 nurses, 7 (23 per cent) were positive, and of 58 mothers, 11 (19 per cent) were positive. Seven male employees were Dick negative. In this group of 271 individuals, 61 had positive Dick tests, and 30 had positive cultures; three had both. Fifteen were not included in the series as they had been discharged from the hospital before immunization was completed. A Dick test was done five days after the fourth dose on the thirty-five children immunized. Six were positive. Four weeks after the fifth dose, all were negative.

TABLE 2.—*Results of Dick Retests on Fifty-Six of One Hundred and Seventy-Six Infants*

	Positive		
	Number	Per Cent	Negative
Before immunization	13	30	43
One month after immunization	0	..	56
Six months after immunization	6	12	50
Of original 13 Dick positives one month after immunization	0	..	13
Six months after immunization	1	8	12
Of original 43 Dick negatives six months later (September, 1931)	5	13	33

Of the eleven adults immunized, one was positive one month after the fifth dose. She was given a sixth dose, a repetition of the fifth, and became negative one month later. Three infants under 3 months of age (one of 2 weeks) showed a positive Dick test. These were not immunized.

Reactions to the Dick toxin were more common and severe than after diphtheria toxoid. In general, the older the child the more severe the reaction. Adults had more severe reactions than children. An interesting feature was the incidence of actual symptoms of scarlet fever following the injection of the toxin; several had sore throats after each injection; many vomited. One child, aged 2 years, after the third injection developed a scarlatiniform eruption, vomiting, fever and sore throat (with minute white patches). Only the negative culture and short duration with no desquamation proved that it was not scarlet fever. The local reaction was much more severe in adults and in general was proportionate to the intensity of the original Dick test. In several cases, intense local reactions were followed by desquamation. The antitoxin (passive immunization) produced no more severe reactions in our small series of three cases than have been noted with other horse serum products.

The continuance of immunizing procedures on newly admitted children and attendants was not deemed necessary or economical after control of the outbreak. Routine nose and throat cultures for hemolytic streptococci replaced these immunizing efforts on this group. Semiannual Dick testing followed by immunization, where indicated, was contemplated. The result of the first of these surveys is shown in table 2. It is based on a retest of the fifty-six infants who remained under observation. Of the five children originally negative, who became positive at the end of six months, two were 12 months, one 5, one 4 and one 2 at the time of the first test. They had not been actively immunized prior to the semiannual retest. Of the thirteen originally immunized Dick positive patients, a 4 months old infant, negative one month after immunization, again became positive six months later.

COMMENT

An outbreak of scarlet fever, which had extended over a period of six weeks, was apparently controlled.

2. Hexylresorcinol solution S. T. 37.

During this period there was a high incidence of scarlet fever in Chicago, the case reports ranging from 155 to 169 per cent of the normal during the first three months of 1931. There were still a large number of susceptible patients in the hospital, as shown by the Dick tests.

Reference to table 2 shows the incidence of Dick positive tests before and one month after immunization and, in addition, the reactions to the injections of the toxin. Six patients who were apparently immune to scarlet fever, as indicated by the Dick test, had become susceptible to the disease by the same test at the end of six months.

CONCLUSIONS

1. Without closing St. Vincent's Infant and Maternity Hospital, an institution with an annual turnover of 300 per cent, it was possible to stop an outbreak of scarlet fever while the incidence was still high outside the institution. Taking cultures of throats, masking the adult hemolytic streptococcus carriers, isolating the infants with positive throat cultures and using an antiseptic in the nose and throat of those harboring hemolytic organisms, making Dick tests of all individuals, passively immunizing Dick positive contacts, and actively immunizing all Dick positive patients were the measures employed.

2. Dick toxin for active immunization produced severe reactions in many older children and adults.

3. As a result of using the technic for active immunization recommended by the Dicks, positive Dick tests became negative one month after the last injection, with one exception, and that one after the sixth.

4. Three infants under 3 months of age, one of whom was 2 weeks old, gave a positive Dick test. They were not immunized and did not develop scarlet fever.

5. In this small series, mutations in skin reactivity to the Dick toxin occurred within six months.

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ACUTE SILICOSIS

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Although it is well known [1] that chronic silicosis follows exposure to silica dust in such industries as mining, stone cutting, asbestos mining, sand blasting and the abrasive industries, it was not until 1929 [2] that acute silicosis was recognized as a result of comparatively short exposure to alkaline silica mixtures in the manufacture of scouring soaps.

Because acute silicosis is a real industrial hazard, hitherto unrecorded in the medical literature in this country, the following cases are presented:

REPORT OF CASES

CASE 1.—An American-Italian, aged 29, entered the hospital, Oct. 27, 1931, acutely ill, being orthopneic and cyanotic. The story later obtained was that in November, 1928, he was first employed to stand over an open machine mixing dry silica and soap in the manufacture of a well known abrasive soap powder. He continued at this work, always in a very dusty atmosphere without protection, until the summer of 1930, when an irritative, dry cough and dyspnea even at rest troubled him. These symptoms became rapidly worse and by January, 1931, twenty-six months after entering this industry, he was incapacitated for work. A roentgenogram of the chest at that time showed advanced silicosis and through the immediate action of Dr. Warren Tilton the case was reported to the Massachusetts Public Health Board. March 5, 1931, the machines in this plant were condemned and production ceased.

Through the summer he continued as an invalid but did not suffer pain. The sputum became mucopurulent and profuse but no blood streaking was seen. For two weeks he had been confined to bed by a common cold, when chills and a blood-tinged sputum marked the onset of drastic changes that led to his appearance in the emergency ward.

The family, marital and past history were noncontributory and he had not been exposed to tuberculosis. There was no history of rheumatic fever.

On physical examination he was obviously very ill, coughing and breathing rapidly with the aid of the accessory muscles. The face was flushed and moist and the temperature was 102 F. The skin over the tibias was rough and scaling, while over the back small, dry, scaling lesions were found. There was no glandular enlargement. Over the chest the percussion note was dull to flat; tactile fremitus and vocal resonance were increased anteriorly below the third ribs, and the breath sounds were high pitched and prolonged in expiration except at the bases, where they were diminished. Coarse sibilant and sonorous râles were heard in all areas. The heart measured 7 cm. to the left in the fifth interspace and 4.5 cm. to the right in the fourth space. The sounds were rapid and regular with accentuation of the second pulmonic sound. Blood pressure was 140 systolic and 80 diastolic. The remainder of the examination was not remarkable. There was no clubbing of the extremities.

Laboratory examinations showed a normal urine, a red blood count of 5.1 million, hemoglobin of 80 per cent (Tallqvist) and the white blood count fluctuating between 15,000 and 18,000. A blood smear stained by Wright's method showed 75 per cent polymorphonuclear leukocytes, 5 per cent eosinophils, 8 per cent lymphocytes and 12 per cent monocytes. A blood Hinton test was negative and a single blood culture gave no growth. Tubercle bacilli were not found in four smears of sputum. A portable x-ray film taken two days after entry showed both lungs grossly abnormal with dulness almost completely obliterating the middle four fifths of both lung fields. Only a small amount of aerated lung was present just above the diaphragms and at the apexes.

The patient was immediately placed in an oxygen tent and became comfortable without cyanosis, but orthopnea persisted. The fifth day after admission the temperature, pulse and respiration fell to normal by crisis and he felt much better but continued to need the additional oxygen to prevent distress. Repeated roentgen and physical examinations of the chest showed no change, but by the fifth day after the crisis he was able to remain out of the tent for three consecutive hours. During one of these periods the vital capacity measured 330 cc. However, this improvement was temporary and then fever and respiratory distress returned and he died on the eighteenth day after entry.

The necropsy, by Dr. L. Edgar Hummel, disclosed that the body was well developed. There was a marked bilateral bulging of the anterior chest wall. The pleural cavities contained 100 cc. of slightly turbid, yellow fluid and showed numerous fine, shaggy, fibrous adhesions over the anterior, lower lateral and posterior surfaces. The interlobar septums were largely obliterated. The lungs were about half normal size. The right and left upper lobes and the right middle lobe were shrunken to one-third the normal size. The lower lobes were relatively large and extended upward to form the apexes. In this respect, as in all others, there was a striking symmetry on the two sides. The middle two thirds of each lung were shrunken, fibrotic and of almost the hardness of stone. In contrast the apexes, the diaphragmatic surfaces and the lower margin of the right middle and left upper lobes were markedly emphysematous, showing air-filled bulbous areas from 0.5 to 2 cm. in diameter. The fibrosed, shrunken portions were very firm and gritty on section. The bronchial and mediastinal

From the Medical Clinic of the Massachusetts General Hospital.

1. Pancoast, H. K., and Pendergrass, E. P.: A Review of Pneumoconiosis, Am. J. Roentgenol. **26**: 556 (Oct.) 1931.

2. Heffernan, P.: Some Notes on the Biophysics and Etiology of Silicosis, Brit. M. J. **2**: 489 (Sept. 14) 1929.

glands were enlarged, varying from 1 to 4 cm. in diameter, and formed conglomerate masses of hard, dark grayish to black tissue that was gritty on section. The trachea was markedly deviated to the right and surrounded by the enlarged glands. The bronchi and trachea contained large amounts of gelatinous, mucopurulent material.

The heart weighed 350 Gm. but showed definite dilatation and hypertrophy of the right side. The right ventricular wall measured 7.5 mm., the left 12.5 mm. The valves were normal. The spleen was enlarged, weighing 350 Gm., and was partially bound to the diaphragm by fibrous adhesions. The mesenteric

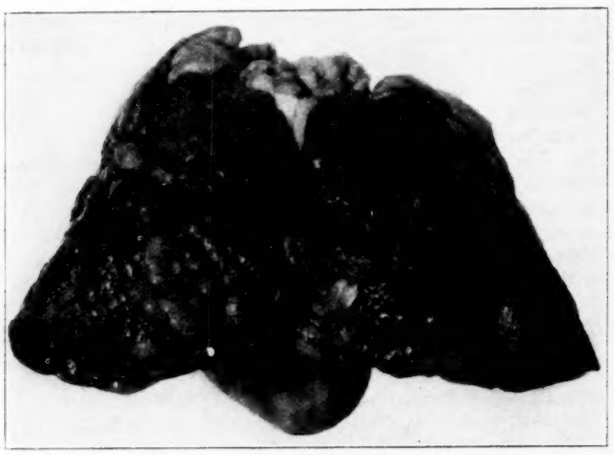

Fig. 1.—Anterior surfaces of the lungs and heart in case 1.

and retroperitoneal lymph nodes were enlarged from 0.5 to 2.5 cm. and were moderately firm but not gritty on section. The remaining organs showed no gross abnormality.

Microscopic examination of the lungs revealed many irregular areas of fibrosis with densely hyaline centers. The remaining alveoli were thickened, fibrotic and either compressed or greatly distended. Some contained fluid and large mononuclear "heart failure" cells. Local areas of bronchopneumonia were present. There were focal areas of necrosis in the liver. Large collections of mononuclear phagocytes were present in the corpuscles of the spleen. The bronchial and retroperitoneal glands showed marked fibrosis, with hyalinization and many immature lymphocytes and multinucleated cells. The latter showed in addition typical foreign body giant cells. Bone marrow from the spine, sternum and femur showed hyperplasia of both the myeloid and the erythroblastic elements.

CASE 2.—A man, aged 45, an American-Italian, entered the outpatient department, Dec. 4, 1931, complaining of shortness of breath and a severe cough. In the past he had been in good health, without a history of rheumatic fever, while employed for ten years as a foreman in the same factory as the first patient. Then in December, 1926, he was placed in charge of two new machines to mix silica and soap, instructing and assisting in their operation but spending several hours daily in other parts of the shop. Eight months later the present illness began with dyspnea and a cough. These symptoms gradually progressed until he was able to do only a very limited amount of work. In June, 1930, he had a severe pneumonia which left him to convalesce over a period of months. At this time he recalled that three other workmen under him had died suddenly of pneumonia. Finally, two days before his entry to the hospital, he had acquired a common cold and gave up all activity.

The physical examination showed that the patient was well developed and was coughing much, raising copious amounts of greenish sputum. The skin was pale and the mucous membranes were cyanotic. The thorax was increased in the anterior-posterior diameter and markedly limited in expansion. The percussion note was dull to flat between the second and sixth ribs on the right and in both interscapular spaces. Tactile fremitus and vocal resonance were diminished throughout. The breath sounds were high pitched and prolonged in expiration except at the bases, where they were barely audible. Coarse sibilant and sonorous râles were heard everywhere but over the left apex. No enlargement of the heart was made out and the sounds were of rapid, regular rhythm with accentuation of the second pulmonic sound. Blood pressure was 108 systolic and 68 diastolic. Except for marked clubbing of the fingers, the rest of the examination was unimportant.

Laboratory examinations showed a normal urine and in one specimen of sputum no tubercle bacilli were seen. A roentgenogram of the chest that day showed the upper two thirds of the right lung dense and slightly mottled; a fan-shaped shadow of dulness extended into the left lung field, and in the region of the interlobar septum there was a quadrilateral area of density 2.5 cm. in two dimensions showing a fluid level. The observations were consistent with advanced silicosis with cavitation.

As he was very ill, admission to the wards was advised but the family preferred to take him home. Death occurred one week later and an autopsy was not obtained.

CASE 3.—A man, aged 27, an American-Italian, presented himself in the outpatient department, Nov. 18, 1931, complaining of shortness of breath and a cough of two years' duration. In April, 1927, he had secured work on the same mixing kettles as the other patients and had continued at this work until December, when he sailed for Italy on a three months' leave to be married. In March, 1928, he resumed work but it was not until twenty-one months later that intermittent chest pains, dyspnea and a cough gradually beset him. Despite this handicap he worked until late in 1930. Through the past year activity had been limited, and he had raised mucopurulent sputum, which was profuse in damp weather. He gave no history of rheumatic fever in the past.

The observations of interest lay in the thorax. Here expansion was limited and the percussion note was dull below the left midscapula. Tactile fremitus and vocal resonance were diminished in this area and the breath sounds were softened here and also below the right fourth rib anteriorly. No râles were heard after coughing. The heart outline was 4 cm. to the right in the fourth interspace and 8 cm. to the left in the fifth. The sounds were rapid and regular with an accentuated second pulmonic sound. Blood pressure was 102 systolic and 60 diastolic. There was slight thickening of the fingers but no definite clubbing.

The laboratory examinations showed a red blood count of 3.6 million, with a hemoglobin of 60 per cent and a normal

Fig. 2.—Section of the left lower lobe in case 1, showing irregular areas of hyalinization, fibrosis and emphysema.

number of leukocytes that were 5 per cent eosinophilic in a stained preparation. The blood Hinton test was negative. A roentgenogram of the chest that day showed both lung fields less radiant than normal and a heart that was large and round, measuring 5.3 cm. to the right and 9.7 to the left. The film with the measurements was taken at 7 feet. There were no mottled areas and a positive diagnosis was not offered. The long bones were normal.

The clinical impression was that the patient had acute silicosis. He was advised to avoid exertion and exposure and take 0.2 Gm. of ammonium chloride eight times daily. When

last seen, Jan. 26, 1932, he was much the same and repeated roentgenograms of the chest showed no change. A vital capacity of 2.7 liters was obtained at this visit. He also volunteered the information that there were two new probable cases of the disease in his fellow workmen.

COMMENT

The appearance of respiratory symptoms after eight, twenty-one and twenty-nine months of exposure to an alkaline dust of high silica content marks a more rapid and severe silicosis than is usual. Russell [3] has seen the disease fully developed in a lens grinder who inhaled a pure quartz spray for eight months. In granite cutters [4] the earliest case without symptoms was found by roentgenograms after two years of service. The rapidly fatal cases of MacDonald [5] occurred in two young girls who had been employed for two and three-fourths and four and one-fourth years packing a similar type of soap. The severity of respiratory embarrassment is attested by the marked decrease in the vital capacity, which was lower in the first case than that usually seen in uncomplicated cardiac failure.

The right ventricular hypertrophy, described in the pathologic examinations, is probably explained by the increased resistance and loss of elasticity in the pulmonary vascular bed. This finding aided in the recognition of the disease in the living patient, in whom the diagnosis could not be made by the roentgenogram alone.

Silica Content of the Tissues

	Mg. of Silicon Dioxide per Gram of Dried Tissue	
	Lung	Bone Marrow
Normal	1.4	0.3
		0.7
In chronic silicosis (King)	123.55	...
In case 1: left upper lung	12.0	1.0
In case 1: left lower lung	13.2	...

No determination was made of the silica content of the dust or soap to which these men were exposed, but estimates of the silica content of the tissues of the first case, done by the method of King,[6] are given in the accompanying table. The data suggest that the reaction in the lungs is not a direct, quantitative one and very likely, as Heffernan believes, the rapid development of fibrosis results from the accelerated formation of a silica hydrosol in the presence of the alkaline soap dust. Ordinarily this reaction progresses slowly in the faintly alkaline tissue fluids and may be so prolonged [7] that symptoms do not appear until years after one has left a hazardous industry.

SUMMARY

The three cases of acute silicosis that have been recorded are among the first such cases in American industry.

The rapidity of the process, in contrast to the usual chronic form, is probably due to the accelerated formation of silica hydrosol in the presence of an alkaline soap dust.

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4. Russell, A. E.; Britten, R. H.; Thompson, L. R., and Bloomfield, J. J.: The Health of Workers in Dusty Trades, U. S. Pub. Health Bull. 187, July, 1929.
5. MacDonald, G.; Piggot, A. P., and Gilder, F. W.: Two Cases of Acute Silicosis, Lancet **2**: 846 (Oct. 18) 1930.
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7. Britton, J. A., and Head, J. R.: Pneumonoconiosis, J. A. M. A. **96**: 1938 (June 6) 1931.

HYPERINSULINISM

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CINCINNATI

Definite instances of hyperinsulinism are still sufficiently rare to justify additional reports of such cases. It is indeed remarkable that the disease can be so readily identified, when so few authenticated cases have thus far been reported. The clear cut symptom complex produced by insulin overdosage, and more satisfactory laboratory facilities, have simplified the

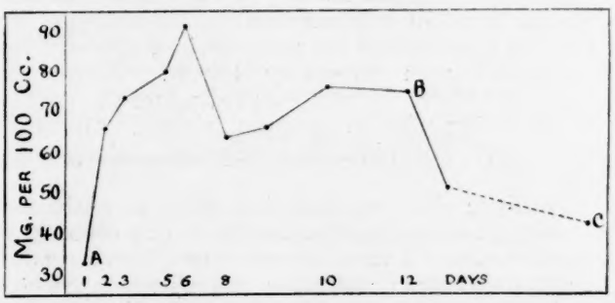

Chart 1.—Fasting blood sugar during two weeks' residence in the hospital: *A*, attack, Dec. 23, 1930; *B*, acute tonsillitis, temperature 99.6; *C*, April 3, 1931.

recognition of the condition. Whether the term "hyperinsulinism" as first used by Seale Harris will continue to be used or whether the designation "spontaneous hypoglycemia" may be a more correct term, especially for the milder types, the future must decide. The multiplicity and variability of the symptoms of hyperinsulinism recall the days when the various forms of thyroid disturbances had not yet been properly correlated and classified. It does not require a far stretch of the imagination to assume that hyperactivity of the islets of Langerhans may logically occur as well as its counterpart, an inadequate secretion, which produces diabetes mellitus. Similar variations are recog-

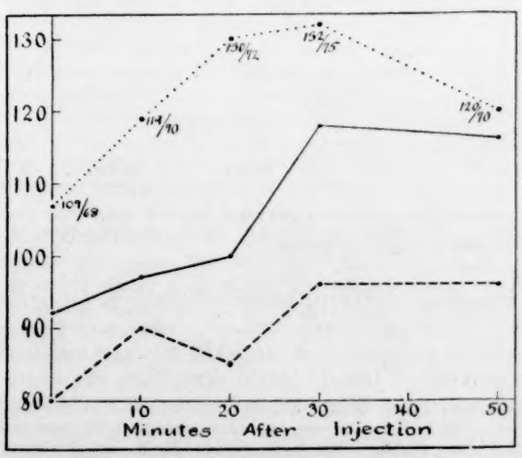

Chart 2.—Simultaneous readings of pulse, blood pressure and blood sugar reaction after intramuscular injection of epinephrine: solid line, blood sugar, mg.; broken line, pulse; dotted line, blood pressure.

nized in practically all the other internal secretory organs.

As I have already stated, Seale Harris [1] was the first to use the term hyperinsulinism and to recognize many of its symptoms and signs. His observations remained

Read before the Academy of Medicine, Cincinnati, April 21, 1931.
1. Harris, Seale: Hyperinsulinism and Dysinsulinism, J. A. M. A. **83**: 729-733 (Sept. 6) 1924.

more or less unconfirmed until the remarkable reports by Wilder, Allan, Power and Robertson,[2] who found at operation, in a case of extreme hypoglycemia, a carcinoma of the pancreas, made up of cells which were histologically similar to those of the islets of Langerhans. Howland, Campbell, Maltby and Robinson[3] are responsible for the first cure of hyperinsulinism (dysinsulinism) in the removal of an adenoma of the pancreas, containing islet structure. McClenahan and Norris[4] report a pancreatic adenoma with hypoglycemia. Thalhimer and Murphy[5] report a case of carcinoma of the pancreas with the symptoms and laboratory observations of hypoglycemia. Krause[6] reports a case of hyperinsulinism. The Finneys[7] have resected a portion of the pancreas in a case of hyperinsulinism, with temporary benefit. Nielsen and Eggleston[8] have recently reported a case of functional dysinsulinism with epileptiform seizures. Allan's further reports would indicate some progress along surgical lines.

All these observers have done much to establish the identity of this new disease, which is now called hyperinsulinism, which term is used to designate a condition presenting certain subjective and objective symptoms and a low endogenous blood sugar. The symptoms described by Harris and subsequent observers include the following: a nervous irritability and anxiety, weakness and fatigability, hunger, tremor, muscular twitching, lack of clearness of vision, diplopia, unsteadiness of gait, syncope, excessive perspiration, loss of emotional control, convulsions and even coma. These symptoms are all comparable to those which follow excessive doses

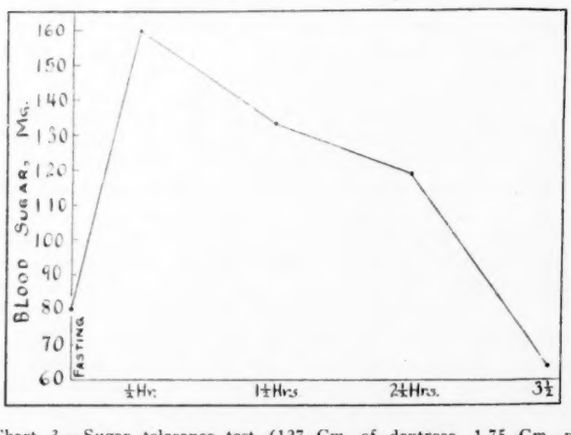

Chart 3.—Sugar tolerance test (127 Gm. of dextrose, 1.75 Gm. per kilogram). The blood sugar tolerance curve does not indicate an increase in tolerance as might be assumed.

of insulin at different levels of the hypoglycemic reaction. Normal blood sugar readings are variously estimated as between 80 and 120 mg. per hundred cubic centimeters of blood. Mild symptoms are most apt to occur when the blood sugar reaches 40 to 50 mg.

2. Wilder, R. M.; Allan, F. N.; Power, M. H., and Robertson, H. E.: Carcinoma of the Islands of the Pancreas, J. A. M. A. **89:** 348-355 (July 30) 1927.

3. Howland, Goldwin; Campbell, W. R.; Maltby, E. J., and Robinson, W. L.: Dysinsulinism: Convulsion and Coma Due to Islet Cell Tumor of the Pancreas, with Operation and Cure, J. A. M. A. **93:** 674-678 (Aug. 31) 1929.

4. McClenahan, W. U., and Norris, G. W.: Adenoma of the Islands of Langerhans with Associated Hypoglycemia, Am. J. M. Sc. **177:** 93 (Jan.) 1929.

5. Thalhimer, William; and Murphy, F. D.: Carcinoma of the Islands of the Pancreas: Hyperinsulinism and Hypoglycemia, J. A. M. A. **91:** 89 (July 14) 1928.

6. Krause, F.: Hyperinsulinism mit hypoglykämischen Symptomenkomplex, Klin. Wchnschr. **9:** 2346 (Dec. 13) 1930.

7. Finney, J. M. T., and Finney, J. M. T., Jr.: Resecting of the Pancreas, Ann. Surg. **88:** 584-592 (Sept.) 1928.

8. Nielsen, J. M., and Eggleston, E. L.: Functional Dysinsulinism with Epileptiform Seizures, J. A. M. A. **94:** 860-863 (March 22) 1930.

REPORT OF CASE[9]

A. M., a man, aged 48, an assistant superintendent of a garage, about seven years ago began to have at long intervals symptoms of cold, weakness and numbness of the extremities. There have existed meanwhile marked constipation and some digestive disturbances, and he had an appendectomy three years ago. The family history was irrelevant and there was no history of venereal disease or of alcoholism. In October the symptoms became acutely aggravated and on one occasion, while he was driving his car, his vision became blurred, an accident resulted and he was unconscious for an hour. Several hours later he had a peculiar attack lasting a few minutes, during which, as he described it, he became violently active, moved his limbs without control, was compelled to grasp at anything, made peculiar grimaces, and was bathed in profuse perspiration. The bowels were constipated, and he had almost continuous headache, either frontal or occipital.

Effect of Medication on Fasting Blood Sugar

Drug	Amount	Method of Administration	Fasting Blood Sugar	Blood Sugar
Ephedrine sulphate.....	0.1 Gm.	By mouth	66 mg.	After 1 hr., 50 mg.
Epinephrine hydrochloride....	1 cc.	By mouth	76 mg.	After 1 hr., 64 mg.
Pituitary solution.....	1 ampule	Intramuscularly	51 mg.	After ½ hr., 62 mg.; after 1 hr., 65 mg.

The patient was first seen by me at his home, Dec. 21, 1930, about 5 p. m. He was fully conscious and rational, and he stated that he had just returned from an automobile ride. He had noticed a gradual increasing weakness and when he arrived home he was unable to walk, hardly able to speak and could not void urine. I found him unable to move his lower extremities. A bilateral Babinski reflex was present. The patient was removed to the Jewish Hospital at once and, on arrival there, again was able to move his extremities well. He did not appear at all ill. He weighed 165 pounds (74.8 Kg.) and had lost 20 pounds (9 Kg.) in two months. The eyes showed a marked arcus senilis, but the pupillary reactions were normal and the neurologic examination was normal except for increased patellar reflexes. The blood pressure was 125 systolic and 80 diastolic. There was some tenderness over the right hypochondrium; otherwise the physical examination was normal. The following morning, December 22, his breakfast was delayed in order to facilitate various blood analyses and at 9:15 a. m. he was found crying, which he said came on him suddenly and was beyond his control. At 10:45 a. m. he suddenly became violently active. He jumped about in bed, throwing his arms about, pulled on the bed clothing, turned the electric lights on and off, and grasped and released again any article he could reach. He made peculiar noises and grimaces, and became actively violent. It took three attendants finally to restrain him, after which he was bathed in profuse perspiration. The attack lasted perhaps ten minutes, when he became quite normal again and did not remember all that had taken place, but he was profusely apologetic. Subsequent to the attack, we were able to get our first laboratory report, which showed a blood sugar of 33 mg. per hundred cubic centimeters of blood. The urine showed a faint trace of albumin, with occasional epithelial and pus cells. The Wassermann reaction was negative. A subsequent test gave a basal metabolism rate of plus 2. Roentgen examination, which was directed especially toward the finding of a pancreatic tumor, gave negative results. Numerous blood sugar estimations were made under various conditions, as illustrated by the graphic charts.

The patient was placed on a diet of five meals, with liberal carbohydrate feeding, and immediately began to feel quite normal and there were no further attacks. He carries candy and chocolate in his pocket at work, and if he suspects an oncoming attack he indulges in these. The carbohydrate

9. Valuable assistance was rendered by Dr. H. I. Katz in collecting the data for this report.

intake is roughly 400 Gm., but I am certain that this varies considerably. His weight has increased 20 pounds (9 Kg.), and I am attempting to give smaller amounts of carbohydrate, including cornstarch, which may give a more slow and continuous addition of sugar to the blood stream. Thyroid extract, so far, indicated on principle, on account of the refractory effect on insulin therapy in hyperthyroid disease, has not given results, but I shall give larger doses. The level of the last fasting blood sugar was 46 mg.

It will be interesting to note in the future whether any of these cases of hyperinsulinism may not burn out and later become diabetic.

In the meantime, it is difficult to decide what therapeutic measures should be used. When one recalls the many dark years, when various methods of carbohydrate and later also of protein restriction in diabetes mellitus were the only recourse, one wonders whether carbohydrate administration may likewise be the only aid in hyperinsulinism when no neoplasm is present. When we see the remarkable results of carbohydrate feeding in the relief of hypoglycemic symptoms, we are inclined to be satisfied with results. But, no doubt, in spite of subjective relief, increasing amounts of carbohydrates may become necessary; then surgery, even if unsuccessful, must be tried. Roentgen diagnosis of pancreatic neoplasm is not promising except when the neoplasm is fairly extensive. Roentgen therapy might be tried but, I fear, would be fraught with many dangerous possibilities. And so, also therapeutically, for the present, surgery appears to be not good enough.

19 Garfield Place.

Clinical Notes, Suggestions and New Instruments

A CASE OF HEMOPHILIA TREATED BY VENESECTION

GEORGE B. LAWSON, M.D.; W. P. JACKSON, M.D., AND J. E. GARDNER, M.D., ROANOKE, VA.

We have had the opportunity of studying a patient with hemophilia who came under our observation in an acutely ill condition. For reasons given later, this patient was treated by venesection with most gratifying results.

REPORT OF CASE

J. E. M., a man, aged 51, referred by Dr. A. B. Graybeal of Marion, Va., was admitted to the Jefferson Hospital, March 27, 1931. Two weeks before admission he began to have a pain in the right lower part of the chest, which was worse on motion and deep breathing. For six days he had had a severe lower abdominal pain and had passed bloody urine several times. The pain was so severe as to require morphine for relief. Three days before admission he became very restless, noisy and delirious at times. He does not remember coming to the hospital or anything that happened for several days thereafter.

He gave a history of repeated attacks of joint trouble, which he thought were due to rheumatism. These started in the first and second years of life and usually followed an injury, often very trivial. The particular joint would become painful, swollen and tender. The knees and wrists gave him the most trouble, but almost every joint in his body has been involved at some time in his life. There are no residual effects except slight stiffness of the knee joints.

Until eight years ago he had had profuse bleeding from the nose and from the roof and floor of the mouth about twice a year. Occasionally he would bleed until almost exsanguinated. The effect of these hemorrhages was a relief from the "rheumatism" in the joints and from headaches. After the cessation of these spontaneous hemorrhages he did not feel so well, the joint manifestations becoming marked, the headaches and dizziness more pronounced. The past history is otherwise essentially negative.

The family history is important. The patient had one brother and three uncles who were bleeders. The former died of a ruptured blood vessel in the throat at 28 years of age. He is said to have had repeated attacks of rheumatism. One uncle bled to death at 10 years of age; one died at 35 (dropsy); the other uncle is still living.

Examination of the patient revealed extreme restlessness, mental cloudiness and delirium. He complained of severe pain in both sides of the chest and in the abdomen. Any movement of the body seemed to elicit an expression of great suffering.

The temperature and pulse were normal. The face presented a congested appearance. There was moderate stiffness of the neck and a positive Kernig sign. Muscular twitchings were noticed in the arms and legs. The fundi were normal. There was dulness over the right lower lobe with diminished breath sounds. No friction rub was heard. Abdominal tenderness and muscle spasm was rather marked, and definite hyperesthesia was present. The bladder was considerably distended. There were numerous subcutaneous hemorrhages, some the size of one's hand.

The hemoglobin was 89 per cent (Sahli); red cells, 4,505,000; white cells, 11,700, with 72 per cent polymorphonuclears. The clotting time was forty-seven minutes, as determined by the venous puncture method (Lee and White). The bleeding time was one minute. Platelets were present in normal numbers. The urine obtained by catheter showed considerable microscopic blood; otherwise it was essentially normal.

A diagnosis of hemophilia was made. The signs and symptoms pointed to the presence of hemorrhage into the meninges, pleural cavities and abdominal viscera, and bleeding from the genito-urinary tract.

COURSE IN THE HOSPITAL

The patient seemed to lose ground for several days after admission and little hope was entertained for his recovery. The signs of meningeal irritation became more marked. Two lumbar punctures were done on separate days and by different operators. Only a few cubic centimeters of bloody fluid was obtained on either occasion. This fluid was rather thick, contained both old and fresh red blood cells, and showed no tendency to clot. No improvement was noted in his mental or general condition.

Two years previously this patient was in our hospital on account of a swollen, painful right knee and leg. Because of his red cyanotic appearance, a hemoglobin of 100 per cent (Sahli) and a red cell count of 5,500,000, he was regarded as a possible polycythemic patient, and 500 cc. of blood was withdrawn, resulting in marked improvement in the joint condition.

Looking back to this experience and in consideration of the present picture, which seemed to be progressing toward a fatal termination, we decided to try bleeding again. April 11, 1931, 250 cc. of blood was withdrawn from an arm vein. The change in his condition was little short of dramatic. He became quieter and the next day his sensorium was much clearer and his general condition seemed improved. He was bled again, April 18, 300 cc. being withdrawn. Improvement continued and his further course was uneventful except for a slight attack of bleeding into the right knee and one rather severe attack of pain in the upper right quadrant associated with tenderness and muscle spasm over the gallbladder region.

He was discharged with instructions to report to his family physician on return of symptoms, which are mainly headaches, vertigo and joint pains. This he does and is always anxious to get the relief forthcoming from venesection. Dr. Graybeal's letter, dated Oct. 27, 1931, reports the progress since leaving the hospital and is as follows:

"In reply to your letter received this morning, relative to J. M., I will say that I have been bleeding him every five or six weeks since his return from the hospital, removing from 500 to 600 cc. of blood at each time. His symptoms, which are mainly headaches, vertigo and joint pains, are almost immediately relieved by the bleeding and remain so for from three to four weeks. He has had no bleeding under the skin since his return from the hospital. His blood pressure reaches from 190 systolic and 110 diastolic to 150/90."

The immediate effect of bleeding has always been relief of symptoms with general feeling of well being. No permanent effect has been obtained by a single withdrawal, but by repeated venesection the course of events has been very favorable. It is our feeling that the procedure was a life saving measure in the acute illness. The beneficial effect was too striking to be accounted for in any other way.

It has long been noticed in these cases that after severe hemorrhage the clotting time is shortened. Sahli [1] first called attention to this fact and gave it as an explanation of the spontaneous cessation of the hemorrhage. It is regretted that we do not have systematic determinations of the clotting time in this patient over a considerable period of time. Observations made following venesection of 400 cc. of blood on the morning of May 5, 1931, are as follows: [2]

	May 5	May 6	May 7	May 8
9:30 a. m.....	58 min.	48 min.	44 min.	58 min.
1:30 p. m.....	48 min.	49 min.	48 min.	43 min.
4:10 p. m.....	48 min.	46 min.	43 min.	45 min.

It is apparent from this that the clotting time is little affected by the removal of blood. But, obviously, conclusions cannot be drawn from so few determinations.

As for the explanation of the beneficial effect of bleeding, it seems plausible that coincident with the exacerbation of symptoms there may be an increased blood volume which is relieved by venesection. But aside from its manner of action, the method seems rational in that it imitates nature, which apparently had given relief until cessation of the spontaneous hemorrhages.

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TREATMENT OF HEMOPHILIA BY AN OVARIAN EXTRACT BY BIRCH'S METHOD

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Numerous theories are propounded as to the hematologic defect in cases of hemophilia. Howell [1] suggests that the trouble lies in the platelets, which, although morphologically normal in number and structure, fail to yield the cephalin necessary for the clotting process to go on normally. Recently Birch [2] confirmed this theory by demonstrating that the platelets of two hemophiliac brothers were much more resistant to anisotonic salt solutions than were normal platelets. In the same paper she called attention to the fact that the female transmits the tendency toward the disease from her father to her son, but as yet no authentic case of hemophilia has been reported in a female. She reasoned that the female must have the tendency toward the disease herself, but that there is something in the female make-up which the male does not have, which represses the development of the clinical manifestations of hemophilia. The one obvious thing lacking in the male compared with the female is ovarian hormone.

Working on this basis, she treated two high-grade cases of hemophilia with an ovarian extract (type and dosage not given) and obtained prompt lasting relief from bleeding. One was a boy of 10 years who had been under observation for eighteen months, having entered the hospital for transfusions several times in that period. The coagulation time was always over one hour in these bleeding phases. Beginning May 5, 1930, he was given daily injections of an ovarian extract until Jan. 1, 1931, with no bleeding during this period. The patient's older brother, in whom the condition was more serious, was given an ovarian extract, April 5, 1930. The condition of the blood became promptly normal. After repeated injections, a fresh human ovarian transplant was grafted into the anterior abdominal wall. There was no excess bleeding at the time of operation and he remained free from bleeding until October, 1930, when some bleeding began again.

Birch [3] later, at the suggestion of Dr. A. J. Carlson of the University of Chicago, showed that in contrast to the urines from normal males, which, when concentrated and injected in sufficient dosage, contain enough female hormone to produce estrus in rats, the urines of five hemophiliac patients failed to produce estrus in a series of twenty-eight white rats.

The following case is reported since the therapeutic response was prompt, and also to suggest that others try treatment of their cases with an ovarian extract in order that a large enough series of this type of therapy of this malady may be assembled to establish thoroughly the value of this method:

C. C., a man, aged 21, consulted one of us (B. R. D.), Sept. 7, 1931, with the complaint of frequent attacks of tonsillitis and colds during the last few years, severe enough to curtail his economic and social activities. His past history was not remarkable, and in answer to the question as to whether he bled abnormally, he replied in the negative. After a tonsillectomy he stated that he knew he was a bleeder from a family of bleeders. Later it was learned that, only several weeks before, he had bled for several hours, following the removal of a tooth, and the bleeding had to be controlled by packing. He also stated that he bled from cuts considerably longer than his normal friends.

Physical examination revealed large cryptic tonsils with caseous masses in the crypts. There were no other positive manifestations of note.

September 10, at 8 a. m., the tonsils were removed in the office by dissection and snare, 1 per cent procaine hydrochloride local anesthesia being used. Bleeding was slight during the operation. Several vessels were ligated. Two hours later, diffuse free oozing began from the entire area of both fossae. Sponges were sewed into each fossa and thromboplastin (10 cc.) injected intramuscularly, with no effect. Bleeding continued until the patient became quite pale and the pulse rose to 130. He was taken to the Pasadena Hospital, and under general anesthesia mattress sutures were placed throughout both fossae. While still on the table, 500 cc. of citrated blood was transfused intravenously (September 10, at 11 p. m.). Bleeding ceased but began again two days later and again was not checked by thromboplastin or another blood coagulant in large doses. The pulse rose from 115 to 150 in two hours and 500 cc. of citrated blood was again given by transfusion (September 13, at 5 p. m.).

Two days later, bleeding began again rather briskly and had been going on for about thirty minutes when one 1 cc. ampule of Park, Davis & Co. Soluble Extract of Ovarian Substance was given. Within five minutes bleeding had stopped and remained checked from then on. The throat healed slowly and twelve days later the patient was discharged healed.

Following the first transfusion, the following family history was obtained from the patient and his father: The mother does not know of any bleeders in her family. Both parents and five sisters and one brother of the patient have no history of abnormal bleeding. The patient and three brothers are known by the family to be bleeders. The oldest brother, aged 37, bled for a week following lancing of the throat for quinsy, and he had severe bleeding for from one to four days following each extraction of a tooth. He also bled excessively at times from cuts made while shaving, and he lives in fear of cutting himself. Another brother, aged 19, bled for four days following tonsillectomy three years ago, and the youngest, aged 15, bled three days following the extraction of a tooth. The last two have had no other abnormal bleeding episodes. The maternal grandfather died at 75 years of age and to the knowledge of the mother had not bled excessively. Seven children of the sisters of the patient are not bleeders, one of whom had had an uneventful tonsillectomy. The patient's oldest brother's three children are also normal. The father's three brothers and one sister and all five of their children have had no excessive bleeding, except one son of a younger brother, who bled severely following tonsillectomy.

Blood studies were not done before operation. The first examination was made, September 11, at 11 a. m., before the nature of the disease was recognized and about twelve hours following the first transfusion. This revealed: hemoglobin, 13 Gm. per hundred cubic centimeters, or 76.9 per cent (Newcomer method); red cells, 4,000,000; leukocytes, 16,400; polymorphonuclears, 77 per cent; monocytes, 7 per cent, and lymphocytes, 16 per cent. The smear showed no noteworthy

1. Sahli, Herman: Ueber das Wesen der Hämophilie, Ztschr. f. klin. Med., 1905, p. 264.
2. Determinations made by modification of the Brodie-Russell-Boggs method.

1. Howell, quoted by Clough, P. W.: Diseases of the Blood, New York, Harper & Brothers, 1929, p. 240.
2. Birch, Carroll: Proc. Soc. Exper. Biol. & Med. **28**: 752 (April) 1931.
3. Birch, Carroll: Hemophilia and the Female Sex Hormone, J. A. M. A. **98**: 244 (July 25) 1931.

changes in the red cells or platelets. Clotting time by the capillary tube method was three and one-half minutes, and the bleeding time (Duke's method) was not prolonged. September 14, at 10 a. m., the hemoglobin was 7.8 Gm., or 46.2 per cent; red cells, 3,050,000; leukocytes, 9,550; polymorphonuclears, 69 per cent; monocytes, 3 per cent; lymphocytes, 25 per cent; eosinophils, 3 per cent. The red cells showed a moderate achromia and slight anisocytosis. Large numbers showed polychromatophilia, averaging 4 or 5 per oil immersion field. A few showed fine stippling. The platelets appeared normal in number and morphology. Clotting time done with venous blood delivered carefully from a syringe into a paraffined 10 mm. tube was fifty-two minutes. A normal control blood clotted in forty-seven minutes. (The delay in both was due to the cold room temperature at the time, about 50 F.) The blood clot retracted normally. Howell's prothrombin time was ten minutes and a normal control six minutes. The bleeding time from a fresh puncture of an ear lobe was five minutes. No purpuric spots resulted about the elbow after application of a tourniquet for three minutes. It is regretted the these studies were not done while the patient was in the bleeding stage. The small differences from normal rather than a markedly prolonged clotting and prothrombin time are explainable on the basis of the effect of the transfusion, which furnished enough of the normal platelets to control the bleeding for about two days, the life of the platelets introduced.[4] Our studies were made seventeen hours after transfusion. However, the clinical picture, the typical family history and the suggestive blood manifestations are sufficient to make the diagnosis of hemophilia.

Urinalyses were negative. The stools contained swallowed blood.

SUMMARY

A case of clinical hemophilia actively bleeding following tonsillectomy was treated by one injection of an ovarian extract, with prompt stopping of bleeding. The response may have been nonspecific or a coincidence, but in view of Birch's similar results we recommend further trial of this type of therapy until sufficient numbers can be treated to evaluate the method properly.

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SPECIFIC HYPERSENSITIVENESS TO OWN BREAST MILK

AN INTERESTING THERAPEUTIC RESULT IN THE TREATMENT OF GALACTORRHEA

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The case reported here appears to be an example of anaphylaxis-like sensitization of a patient to her own breast milk.

In a previous communication, I[1] mentioned having observed three patients who had a serum sickness-like illness following rapid absorption of their own milk. The condition in each case could be relieved through the use of a breast pump. One case, which followed the weaning of a baby, was quite severe and necessitated the use of repeated doses of epinephrine.

The following case of breast milk sensitiveness was more completely studied than those previously reported. The condition was transferred passively, and rapid desensitization followed treatment.

REPORT OF CASE

History.—A woman, aged 35, of strong allergic strain, following the weaning of her second child seven years previously, noticed that the breast continued to secrete a little milk. This usually amounted to about a drachm a day and was noticed constantly up to the time that she consulted me.

The patient had been subject to allergic eczema for some eight years, caused apparently by sensitiveness to egg and to heat. She had at odd times had attacks of asthma.

Examination.—Physical examination was negative except for generalized scaly eczema and for the fact that milk could be expressed from the breasts.

Skin tests with a large number of substances gave negative reactions except for a positive test to whole egg, egg white and egg yolk. Tests made by the application of heat from a 1,500 watt nitrogen lamp would precipitate intense itching, which could be relieved by the application of cold.

Course of the Disease.—On an egg free diet she was very much improved. Subcutaneous injections of tiny amounts of egg or the ingestion of infinitesimal amounts of egg would promptly cause intense itching, asthma or both.

On an egg free diet and after treatment with egg and after tolerance for heat was increased through frequent alternating applications of heat and cold, she was very much improved but not completely relieved.

At this point it was decided to test her with her own breast milk. Serial dilutions of her own milk were made, 1 : 10, 1 : 100, 1 : 1,000 and 1 : 10,000 for intracutaneous injections. The intracutaneous injection of 0.02 cc. of the 1 : 10,000 solution gave rise to an immediate hive with pseudopods about 4 cm. in diameter. This was surrounded by a large area of erythema, which was associated with intense itching of the skin and asthma. A tourniquet was applied above the site of inoculation and the reaction was controlled with epinephrine.

The blood was withdrawn and a specimen of serum obtained and injected in 0.1 cc. quantities intracutaneously into two localities in three different normal individuals. The following day the supposedly passively sensitized areas were tested with the most concentrated dilution of the patient's own milk and with cow's milk. The patient's milk, injected into the passively sensitized areas, in each case gave rise to a typical hive. The three similarly sensitized areas were injected at the same time with cow's milk and gave negative reactions, as did also injections of the patient's milk into unsensitized areas in each of the three individuals.

The following day the patient was given a second inoculation with her own milk without the appearance of a reaction. She was then tested with a 1 : 1,000 dilution and a 1 : 100 dilution and later with a 1 : 10 dilution. Each gave almost negative results. The following day she was tested again with the most concentrated extract of her own milk and with breast milk obtained from another source. Both reactions were flatly negative. Another specimen of her own milk was then made but on testing gave negative reactions. Passive transfer tests were then tried again but proved to be flatly negative.

Surprising to relate, the secretion of her own breast milk, which had been constantly present for some seven years, began to diminish rapidly and in a short time, approximately two or three weeks, was no longer to be observed nor could milk be expressed from the breast. After a period of several months she again gave positive intracutaneous tests to her own milk but not comparable in degree with those obtained formerly. Also passive transfer tests were only indefinite or negative.

Relief of dermatitis and asthma following therapy as described has amounted to enough to change a miserable invalid with suicidal inclination into a relatively healthy person.

COMMENT

It seems from the data at hand that this patient had become sensitized to something in her own milk to such an extent that it could be demonstrated not only by skin tests but also by passive transfer. A result resembling desensitization in animal anaphylaxis followed treatment and severe reaction to her own milk together with disappearance of lactation, which had been constant and had resisted all forms of therapy for many years. Allergy studies could not be made more complete because of the sudden disappearance of the patient's illness.

CONCLUSIONS

In a patient who continued to secrete small amounts of milk for seven years after her last pregnancy, it was found that local and constitutional reactions followed intracutaneous testing with a dilute solution of her own milk.

Sensitiveness was transferred passively by the Prausnitz and Küstner method and both passive transfer test and original direct tests in the patient were specific for human milk.

Loss of sensitiveness rapidly followed subcutaneous treatment with breast milk. Following this, the secretion of breast milk ceased. This might prove to be a useful method of therapy in patients who continue to secrete milk for prolonged periods of time after the weaning of a baby.

820 Professional Building.

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4. Clough, P. W.: Diseases of the Blood, p. 242.
1. Duke, W. W.: Asthma, Hay Fever, Urticaria and Allied Manifestations of Allergy, St. Louis, C. V. Mosby Company, 1925.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.
H. A. CARTER, Secretary.

PHYSICAL CHARACTERISTICS OF HIGH FREQUENCY CURRENT

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AND
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In the intensive study period of premedical and preclinical years, little time is devoted to the study of physics. In many cases no effort is made by those responsible for the instruction of physics to show any medical application of their subject and, accordingly, the student just commencing to study medicine is often inclined to neglect the subject and give to it the minimum time. As a result, the small amount of physical knowledge acquired as a premedical student is likely to be temporarily forgotten under the overwhelming load of anatomy, chemistry, physiology and so on. It is for this reason that we will commence our paper with a brief review of some of the fundamental principles of electricity that are applicable to the action of high frequency. This brief review will be by no means complete and it can be supplemented by the table of definitions published by the Council on Physical Therapy.

PHYSICAL THEORY

1. *Nature and Characteristics of the Electric Current.*—The physicist pictures the electric current in a metallic conductor as a stream of particles of minute mass and carrying a definite electrical charge. The motion of these particles, called electrons, in the conductor constitutes the electric current, and it may be defined as a certain number of charges, expressed in coulombs, passing a certain point in a given time, in much the same manner as a current of flowing water would be measured. There are several effects that indicate the passage of the current. In the first place, as discovered by Oersted, there is always associated with this current a magnetic field. A measure of the strength of this magnetic field would give a measure of the current. This principle is utilized in ammeters, voltmeters and galvanometers of the moving coil or moving magnet type. A second effect of the electric current is the production of heat in a conductor carrying the current. It is this phenomenon that is fundamental for diathermy, in which case the human body is the electrical conductor of the diathermy current. The heat production in a conductor through which a current flows is also used as a measure of the current. This fact is utilized in the construction of the thermocouple voltmeter and ammeter, which are used extensively in high frequency measurements. In these instruments a thin wire, which carries the current to be measured, passes through a small evacuated glass bulb with airtight seals at the places where the wire enters. On the middle of this wire in the bulb a thermocouple junction is sealed. This thermocouple junction consists of two wires of different metals and is the seat of an electromotive force whose value depends on the temperature of the heated wire and which in turn depends on the value of the heating current. Thus the hotter the wire, the greater the electromotive force of the junction. A typical vacuum thermocouple is shown in figure 1, taken from a catalogue of the Western Electric Company.[1] A third effect of the electric current was the first to be discovered and is of physiologic importance. This is the galvanic effect, named after its discoverer, Galvani, whereby an electric current causes a muscle to contract. This was early recognized as a test for electrification. However, this stimulation does not occur if high frequency current is used.

2. *Laws Governing Flow of Currents.*—(*a*) Ohm's Law: An electric current is driven through a conductor under the influence of a certain force or pressure or tension. This is the electromotive force and it may be derived from chemical energy stored in a battery or from electromagnetic energy propagated through space from a transmitter, or again from an electrical generator. Whatever its source, this driving electromotive force is measured in volts. The current is measured in terms of a flow of electrical charges. Electrical charge is measured in coulombs and hence the unit of electric current is the flow of one coulomb per second.

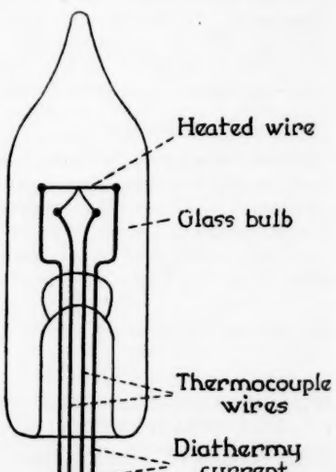

Fig. 1.—Construction of vacuum thermocouple used to measure high frequency currents and effective voltages.

This is unit current and is designated as the ampere. In any circuit there is always a certain amount of opposition to the flow of the current. Thus for a given fixed voltage, i. e., electrical pressure, the amount of current flowing will depend on the resistance to that flow. An interesting analogy is the flow of water from a pipe at the bottom of a tank. In this case the height of the water level above the pipe in the tank would determine the pressure, and the diameter and length of the outlet pipe would determine the rate of flow or the current. The same relation holds between flow of electric current and the pressure or voltage. Expressed mathematically, the relation is

Current (amperes) = voltage (volts) divided by resistance (ohms)

That is, reducing the resistance would increase the current. This law, discovered by Ohm, is called Ohm's law. The unit of resistance is the ohm and is defined as that resistance which allows 1 ampere of current to pass under a pressure of 1 volt. It is modified somewhat for alternating currents, as will be explained later.

(*b*) Joule's Law: An electric current traversing a conductor produces heat, which is measured in terms of calories; thus, 1 calory is the amount of heat neces-

1. Graybar Electric Company: Catalogue on Vacuum Thermocouples.

sary to raise 1 Gm. of water from 15 C. to 16 C. The exact quantitative relation between these two forms of energy, namely, heat and electricity, was first derived by Joule and is called Joule's law. The heat in calories produced by a current traversing a resistance is given by the expression

Heat (calories) = 0.24 (amperes)^2 multiplied by resistance (ohms)

3. *Direct Current.*—In this paper we are not immediately concerned with direct current but it is mentioned in order to draw a distinction between direct and alternating current. In a direct current the stream of electrons flows in one direction through the circuit. Such a current is produced by a battery directly placed in a circuit or by direct current generators or by rectifiers whereby the alternating current is converted to direct current. The magnetic field has a constant value for a constant direct current and exerts a force in one direction. Direct current is used clinically in ionic medication.

4. *Alternating Current.*—(*a*) Frequency: During the flow of an alternating current the electrons move back and forth in a conductor, periodically reversing their direction of flow. Their very movement constitutes the electric current. If one considers a single electron, this might be thought to oscillate back and forth about its position of rest. The number of times the current reverses its direction of flow in a second is twice the frequency. The time between two successive reversals is half of a cycle and consequently the frequency is expressed as cycles or kilocycles per second.

(*b*) Capacity: For purposes of physical therapy a condenser may be considered as two conducting sheets separated by a nonconductor or, as it is termed in this case, a dielectric. Diagrammatically such a condenser is shown in figure 2. Thus, a direct current cannot pass through a circuit containing an ideal condenser. Usually, however, the dielectric is not a strict nonconductor and a small amount of direct current can pass between the plates. The better the insulating properties of the dielectric, the less direct current would pass and the more closely would the condenser resemble a theoretically ideal condenser in which the direct current flow is zero.

A condenser possesses the ability to accumulate an electrical charge. If condenser plates are connected to a battery, a current will flow until a certain electrical charge accumulates on the condenser plates, one plate containing a positive, the other a negative, charge, corresponding to the battery terminal to which the particular plate is connected. The amount of charge collected on the plates depends on the voltage applied and the dimensions of the condenser. The larger the plates and the smaller the distance between the plates, the greater will be the charge (electrons or coulombs) on the condenser. This is expressed by the relation

Charge = voltage × capacity

where the capacity depends on the shape and dimensions of the condenser. In the usual type of condenser, i. e., parallel metallic plates separated by a dielectric, the capacity has the value

$$\text{Capacity} = \frac{\text{Dielectric constant multiplied by area of one plate}}{4\ \pi \text{ multiplied by distance between plates}}$$

The dielectric constant has a value between 1 and 80 and depends on the chemical nature of the dielectric. The capacity has dimensions of length and may be expressed as centimeters or as farads, this last mentioned term being defined in terms of charge and voltage. Thus, 1 farad is the capacity of a condenser in which a potential of 1 volt places a charge of 1 coulomb on the condenser plates.

When an alternating voltage is applied to the plates of a condenser, the plates accumulate alternately, with every reversal of the current, a negative and a positive charge. This alternate charging necessitates the motion of charges which accumulate on the plates. Hence an alternating current flows although there is no conduction current flowing through the dielectric between the plates. From the foregoing description of capacity it follows that, the greater the capacity, the more charges will be collected on the condenser plates and the greater the current which will flow in the conductors leading to the condenser plates. This electron movement, that is, the alternating current, will increase as the frequency is increased. The alternating current flowing through an ideal condenser has the value

Current = 2 π voltage × frequency × capacity

Hence the greater the frequency and capacity, the greater the current.

(*c*) Inductance: A direct current on passing through a metallic wire produces in the neighborhood of the wire a magnetic field. With a constant direct current, this field has a constant value. With an alternating current, this field alternates in direction and magnitude and with the same frequency as the current. This

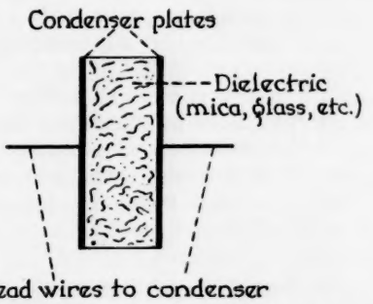

Fig. 2.—Construction of a condenser: Metallic plates are separated by a dielectric.

field has to be continually changed and the process of changing tends to decrease the current. Its effect on the current resembles the effect of inertia on the movement of any body. Thus it tends to oppose any change of the current, and the greater the number of alternations the greater will be the opposing effect. The strength of the magnetic field in the neighborhood of a wire carrying a current depends on the geometrical manner in which the wire is arranged. Thus, a wire arranged in a spiral will have associated with it a greater magnetic field than a straight wire. It is said to have a greater inductance, and the greater the inductance the greater will be the opposing effect of the magnetic field variation against the alternating current flowing through the conductor. The unit of inductance is the henry.[2]

(*d*) Impedance: In the discussion of Ohm's law it was mentioned that when an electric current, whether alternating or direct, traversed a conductor with a definite resistance, the resistance had the value

Resistance = voltage divided by current

Consider now a direct current passing through a coil of wire having a resistance of R ohms and a self induction of L henrys. As before, the ratio of voltage to current equals the resistance. If an alternating current passes through the coil, the ratio of voltage to current

2. The henry is defined in the Bulletin of the Bureau of Standards, number 74, pages 15 and 243.

does not equal the resistance but has a value greater than the resistance R. From what has been mentioned in regard to inductance, it follows that the inductance as well as the resistance is effective in reducing the alternating current. In the case of alternating currents, the ratio of voltage to current is called the impedance, and in the foregoing example of the coil of resistance R and inductance L the impedance will become a pure resistance either if L is zero or if the current is a continuous direct current. A still more complicated case is a circuit containing capacity, inductance and resistance. The impedance, as before, is the value of the voltage divided by current, and its value depends on the resistance, inductance, capacity and frequency. An impedance may be divided into two parts: (1) reactance and (2) resistance.

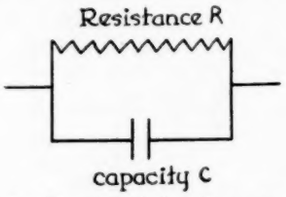

Fig. 3.—Characteristic impedance circuit.

An alternating current in traversing a resistance produces heat in accordance with Joule's law. If the current is to be regulated by adjusting resistance, changes in the resistance cause changes in the heat loss. However, an alternating current in flowing through a circuit containing inductance or capacity or both would produce no heat if the resistance were zero. The current may be regulated by varying the inductance or capacity without any change in the energy loss due to the formation of heat. The part of the impedance which consists of capacity and inductance and which offers an opposition to the current without involving heat loss is called the reactance. Thus the reactance factor of a coil containing inductance L and resistance R is $2\pi L \times$ frequency, and the impedance has the value

$$\sqrt{R^2 + 4\pi^2 f^2 L^2}$$

where f is the frequency.

From the discussion of capacity it follows that the reactance of a condenser is $\frac{1}{2\pi fC}$; that is, the greater the frequency or the greater the capacity the smaller is the capacity reactance.

As a general statement, it may be said that the impedance is the sum total of all the influences tending to oppose the current. The impedance varies with frequency, while the resistance remains constant. The impedance defined as voltage divided by current is, like the resistance, measured in ohms.

(*e*) Impedance of Resistance and Capacity in Parallel: In a physical study of high frequency characteristics, as will appear later, it will be necessary to consider the arrangement of a resistance in parallel with a condenser, and to determine how the impedance of such a system varies with frequency. The impedance is not difficult to calculate mathematically and has been derived in many papers. The effect of frequency on the impedance of this system can be readily understood from the foregoing considerations of reactance and impedance. The system diagrammatically is shown in figure 3.

For direct current the impedance would be equal to the resistance R. For low frequency it would be slightly less than R since some of the current would pass through the condenser. Thus the condenser would short circuit the resistance and this short-circuiting effect would become greater at higher frequencies since the reactance to the alternating current is $\frac{1}{2\pi fC}$ and hence would decrease with increasing frequency. At very high frequencies most of the current would flow across the condenser, since its reactance would be very small (that is, as f becomes great, $\frac{1}{2\pi fC}$ becomes small) while R would remain constant. If C were large, the impedance at high frequency would in many cases be small enough to be neglected. This effect is of great importance as it explains why a large current can be conducted through the body at high frequency, whereas at low frequency only a small current with its small heating effect is possible; that is, for a moderate voltage. This will be apparent later.

(*f*) The Effect of Inductance and Capacity on the Frequency of an Oscillating Circuit: In the production of a high frequency alternating current by a vacuum tube oscillator of a diathermy machine, an alternating current is produced in a circuit containing inductance L, capacity C and resistance R. Such a circuit is shown in figure 4. The usual physical explanation of the process is that a charge built up on a condenser plate flows through the circuit and accumulates on the other plate. This discharges again, flowing in the opposite direction. Electrons thus swing from one plate to another through the circuit. The frequency of the oscillating current depends on the value of the inductance and capacity. If the resistance R is small, the frequency f is

$$f = \frac{159.2}{\sqrt{L\text{(henry)}\ C\text{(microfarad)}}}$$

The alternating current also produces waves of electromagnetic radiation which are emitted from the circuit. The wavelength of the radiation in meters is

$$\lambda = 1{,}884{,}000\ \sqrt{L\text{(henry)}\ C\text{(microfarads)}}$$

Thus it follows that to increase the frequency or to decrease the wavelength it is necessary to reduce the capacity and inductance of the oscillating circuit. It is this electromagnetic radiation, which has approximately the same wavelength as radio waves, that interferes with radio receiving sets in the vicinity of diathermy machines.

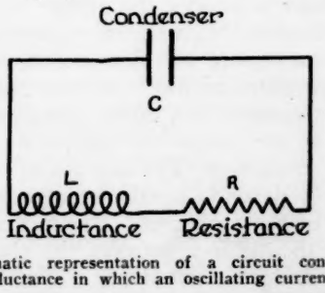

Fig. 4.—Schematic representation of a circuit containing capacity, resistance and inductance in which an oscillating current is generated.

5. *Methods of Producing Alternating Currents.*—Among the many methods for producing alternating currents may be mentioned the induction coil, the Vreeland oscillator, the alternating current generator, the spark transmitter or, for our purposes, the usual spark gap diathermy machine and the vacuum tube oscillator. In medical practice the last two are the most important and a brief discussion of the circuits of each of these will follow.

(*a*) The Spark Gap Diathermy Machine: A proper understanding of this type of circuit is of value to the

physician using diathermy therapy and to the technician handling the machine. On account of the wide use of this type of machine, it will be described in some detail. A diagram of the circuit is given in figure 5.

In a diathermy machine the heaviest and largest piece of apparatus is a transformer (*T*, fig. 5). A 60 cycle current (the usual city current) passes through the

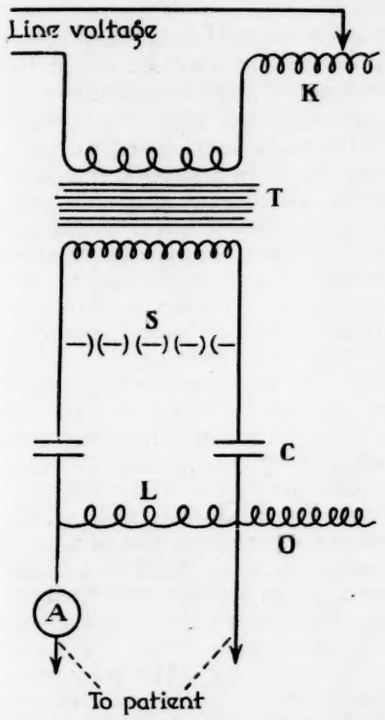

Fig. 5.—Diagram of a typical spark gap diathermy machine: *K*, variable inductance in primary circuit of input transformer to regulate current; *T*, 60 cycle transformer; *S*, spark gaps; *C*, condensers in oscillating circuit; *L*, inductance of oscillating circuit; *O*, Oudin coil; *A*, high frequency ammeter.

primary coil of this transformer. This current is regulated by a variable inductance *K*, which, as already mentioned, can reduce the current without any appreciable heat loss. There are usually from 50 to 100 turns in the secondary to every single turn of the primary, with the result that the secondary voltage is from 50 to 100 times that of the primary voltage. This high voltage alternating 120 times a second is applied to the condensers *C*. The spark gaps are insulators and do not conduct a current until a high voltage causes a spark to jump across the gaps. When this occurs, their resistance falls to a low value. The condenser voltage increases as the voltage increases, in a wave from the secondary of the transformer. When the condenser voltage reaches that value for which the resistance of the gaps breaks down, sparks jump across the gaps and the condensers discharge. An alternating current is produced whose frequency is given by the aforementioned formula. It is this alternating current resulting from the condenser discharge which flows through the patient and the ammeter *A* (fig. 5). A schematic picture of this process is given in figure 6. The *A* wave represents the surges of 60 cycle voltage applied to the condenser plates. When the voltage exceeds the critical value *D*, conduction across the gap occurs and a current, as pictured by the lower figure, traverses the oscillating circuit; i. e., the circuit *LCS* of figure 5, and the patient. It is to be noted that this is a high frequency oscillating current, which occurs in wave trains or pulses. In each train the peak voltage applied to the patient commences with a high value *D* but is quickly damped to smaller values. At the next wave-train this process is repeated.

As already mentioned, the figure is schematic. It is difficult to represent movements of a current which oscillate with the almost inconceivable rapidity of one million cycles per second, which is approximately the frequency of the diathermy current. Recently, however, in the Electrical Engineering Laboratory of the University at Minnesota, Mr. I. Chalek, with an electron oscillograph of special design made by the General Electric Company, has succeeded in photographing the fluctuations of this oscillating current from spark gap diathermy machines. Some of these photographs, from work unpublished at present, are given in figure 7.

(*b*) The Vacuum Tube Oscillator: It is only in the past few years that vacuum tube oscillating circuits have been developed to such a stage that they are of practical value in the clinic. Their success is due to the fact that they can be operated from the 110 volt 60 cycle supply current. However, it is doubtful whether or not they will ever replace the spark gap type, which is quite satisfactory for general and local diathermy treatments. There is the possibility that because of their different wave form they may be favorable for surgical diathermy, but that is a point which at present lacks experimental verification. For local and general diathermy, however, the spark gap type can heat the tissue just as efficiently as the vacuum tube type of machine, as far as present knowledge of the subject has advanced.

The thermionic vacuum tube [3] is a highly evacuated glass bulb containing three or more electrodes. The filament is a thin wire, often coated with thorium, and is heated by a suitable current. This heated wire emits electrons. The plate electrode, or plate, is a large flat

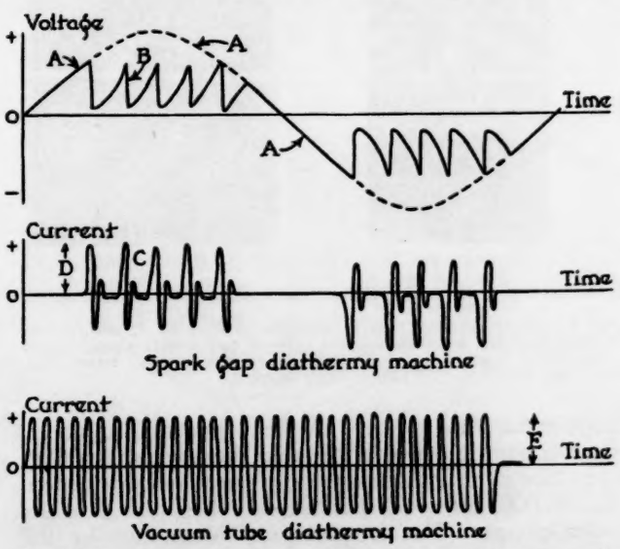

Fig. 6.—Wave forms of high frequency currents: upper curve, voltage variation at spark gaps; *A*, 60 cycle voltage from secondary of transformer *T* (fig. 5); middle curve, type of current which passes through patient during a diathermy treatment from a spark gap machine; lower curve, type of current from a vacuum tube machine.

piece of metal and is connected to the positive terminal of a high voltage source while the filament is connected to the negative side of this high voltage source.

3. Morecroft, J. H.: Principles of Radio Communication, New York, John Wiley & Sons. Van der Bijl, H. J.: The Thermionic Vacuum Tube, New York, McGraw Hill Book Company. Dellinger, J. H.: Principles of Radio Communication, Signal Corps, U. S. Army. Louer, H., and Brown, H. L.: Radio Engineering Principles, New York, McGraw Hill Book Company, 1928.

The plate being positively charged with respect to the filament, electrons are carried to the plate, thus conveying an electric current through the tube. The third electrode, the grid, is a wire mesh electrode placed between the filament and the plate. The stream of electrons traveling through the tube from filament to plate is extremely sensitive to small voltages applied between filament and grid. A small negative voltage may reduce the plate current to almost zero.

One important property of the vacuum tube is that an electric current can pass from filament to plate but not in the reverse direction. This property of unidirectional conductivity enables the tube to function as a rectifier; that is, to produce direct currents from alternating currents. Another property is its ability to amplify small electrical changes and is due to the fact that a small change in grid voltage produces a large

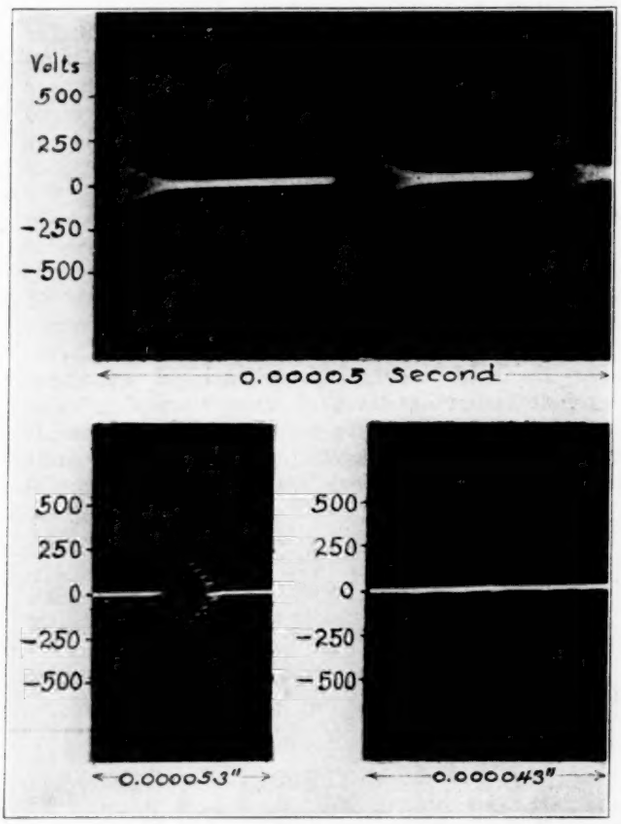

Fig. 7.—Representative types of diathermy currents: *A*, cutting current, slow damping, wave trains from 0.00001 to 0.000015 second apart; *B*, coagulation current wave train; *C*, diathermy current wave train, wave trains 0.0001 second apart; rapid damping.

change in the plate current. A third important property, from the point of view of physical therapy, is its abiljty to produce alternating currents of any frequency from 0 to 100,000,000 cycles per second when placed in the proper circuit. The frequency is determined by the inductance and capacity of the oscillating circuit. There are many types of oscillating circuits which may be found in any textbook of radio or physical therapy.[3]

The current produced by the vacuum tube oscillator is a continuous sine wave current in contradistinction to the damped harmonic wave of the spark gap diathermy machine. These two wave forms are represented in figure 6. In diathermy if heat production is the only physiologic effect there is no fundamental reason why one wave form should not be as effective as another, although experimental research to prove this point is lacking.

A vacuum tube circuit to produce continuous wave currents as used in surgical diathermy is shown in figure 8.

CONDUCTION THROUGH SOLUTIONS AND TISSUES

The living cell is a solution. In human tissues, cells are bathed in an external solution of lymph; and an electric current in order to reach the cells has to pass through this lymph fluid. Thus the problem of electrical conduction in the tissues is a problem of conduction in an electrolytic solution, and a tissue may be regarded as a nonhomogeneous solution.

1. *Mechanism of Electrolytic Conduction.*—In metals the electrical charges are carried by the electrons of inappreciable mass. In a solution the electrical charges are carried by electrolytic ions each one of a mass several thousand times as great as the electron. The type of ion depends on the type of the electrolyte. The positive ion may be a hydrogen ion, a sodium ion or a complex protein ion. When a direct current passes through an electrolytic solution between metallic electrodes immersed in the solution, the positive ions move to the cathode, the negative ions to the anode. Usually, however, one ion moves faster than the other with the result that there is a concentration change, the electrolyte tending to accumulate near the electrode toward which the faster ion moves. There is also a characteristic chemical effect at the electrode. Thus there may be production of a gas, deposition of a metal, or formation of an acid or a base. With an alternating current, the ions move first in one direction, then the other, and, consequently, there is no concentration change of the electrolyte in the solution, except for the small amount deposited at the electrodes. The latter becomes less and less as the frequency is increased. Hence when at high frequency a current of electricity traverses the solution, heat is produced in the solution owing to its electrical resistance, and there is no change in the chemical or physical state of the solution, other than the effects due to heat.

2. *Polarization.*[4]—If a direct or low frequency alternating current from a given fixed voltage is passed through a solution and the frequency is increased, it is found that more current will pass the higher the frequency. In other words, the impedance decreases with higher frequencies. It has been shown that this is due to an effect called polarization, which takes place at the electrode solution boundary. Helmholtz postulated that at the boundary, electrolyte-metal, there is a double layer of ions, one layer on the metal, the other in the solution, and these layers are separated by a distance of molecular dimensions. At low frequencies of the alternating current, according to Warburg,[5] when there is appreciable ionic movement into the layer there is the added effect of these movable ions. The latter effect, however, is small at high frequencies when the Helmholtz double layer is alone effective.[6] This double layer behaves as a condenser with a large capacity in parallel with a resistance. We have already shown that the impedance of such a system becomes small at high frequency. As a result, with diathermy frequencies

4. Wien, M.: Polarisation bei Wechselstrom, Wied. Ann. **58**: 37, 1896. Helmholtz, H. L. F.: Studien über elektrische Grenzschichten, Wied. Ann. **7**: 337, 1879. von Hevesy, G.: Elektrolyse und elektrolytische Polarisation, Handbuch der Elektrizität und des Magnetismus, 1921, p. 473.

5. Warburg, E.: Ueber das Verhalten sogennanter unpolarisierbar Elektroden gegen Wechselstrom, Ann. d. Phys. **67**: 493, 1899. Neumann, E.: Ueber die Polarisationcapacität umkehrbarer Elektroden, Ann. d. Phys. **67**: 500, 1899.

6. Kruger, F.: Ueber Polarisationskapazität, Ztschr. f. physik. Chem. **45**: 1, 1903. Kruger, F.: Oszillatorische Entladung polarisierter Zellen, Ann. d. Phys. **21**: 701, 1906.

polarization is negligible and it is not necessary to use special electrodes to eliminate this effect. In other words, block tin electrodes in contact with sodium chloride solution, as are used in diathermy treatments, have an inappreciable polarization at high frequency.

3. *Stimulation and Frequency; Nernst's Law.*—It was in the last decade of the nineteenth century that d'Arsonval made the important discovery which is so fundamental to diathermy. This was that, whereas a low frequency current of a given value would produce a violent contraction of a muscle, the same amount of current at high frequency would produce no effect other

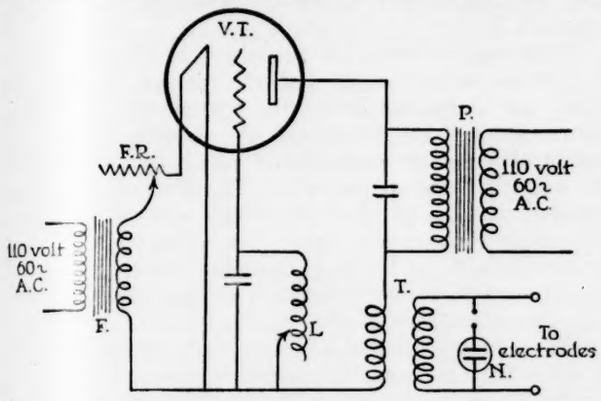

Fig. 8.—Vacuum tube circuit to produce high frequency current: *F*, filament transformer; *P*, plate transformer; *V. T.*, vacuum tube; *T*, air core transformer; *L*, variable inductance of oscillating circuit; *N*, neon lamp in external circuit containing patient. *L* is tuned until oscillating circuit and external circuit are in resonance, as indicated by brightness of the neon lamp. *F. R.*, filament rheostat to regulate the current heating the filament.

than a heating. Nernst [7] postulated that the stimulation was due to an accumulation of ions at a cell membrane and derived the formula known as Nernst's law that the current necessary to stimulate varies as the square root of the frequency. Ionic motion with rapidly alternating currents is very small and hence there is no tendency for these ions to move sufficiently far from their equilibrium positions to cause a stimulation. This makes it possible to send large high frequency currents through a patient without producing the sensation of an electrical shock.

4. *Conduction of High Frequency Currents Through Tissues.*—It has already been mentioned that the impedance of a solution decreases with increasing frequency, owing to a decrease of the polarization effects. A similar effect takes place in tissues except that the decrease of impedance with frequency is much greater. At low frequencies, i. e., 1,000 cycles per second, the impedance may be several thousand ohms, while at high frequencies it might decrease to approximately 100 ohms. Such a high impedance at low frequency permits little electrical current of relatively low voltage to flow and the heating is negligible.

The reason for this high impedance at low frequency is explained by Gildemeister [8] and others as being due to the cell membranes. The cell membrane may be pictured as a thin insulating dielectric layer of high resistance, situated between the cell interior of low resistance and the external medium of low resistance. A cell may be represented as an electrical system as in figure 9. The membrane behaves to the alternating current as a condenser with a parallel resistance. As we have seen, the impedance of such a system is small at high frequencies if the capacity is large. From experiments of McClendon, Fricke [9] and others, the membrane thickness is of molecular dimensions which would make *C* very large. At high frequencies, then, the impedance due to the cell membranes (and there are thousands of membranes in the current path) is negligible. The only effect is that of a pure resistance of the cell interior and the external fluids. We may then conclude that at high frequency, since polarization and cell membrane impedances are negligibly small, the tissue behaves as a pure resistance.

APPLICATIONS OF PHYSICAL AND CHEMICAL THEORY

1. *Diathermy.*—The usual circuit for a spark gap diathermy machine is given in figure 4. Electrodes are placed on the body of the patient at the region where the heating effect is desired. The electrodes are connected to the machine as indicated in the diagram. The high frequency current traversing the tissues is measured by the ammeter, *A*. The methods of treatment and the clinical cases to which diathermy is beneficial are fully described in numerous books [10] on the subject and will not be discussed further here. It is generally believed that the beneficial effects are entirely due to heat production, although some physical therapists have claimed other rather vague results. There are two types of diathermy, local and general. In the local type, a heating is desired in some small region near the electrode in a joint or an extremity. The general body temperature remains normal. In the general treatment, the entire body temperature is raised. The latter type of treatment requires larger electrodes and larger currents than for the local treatments. A large diathermy machine which is capable of supplying sufficient energy is required for general treatments.

2. *Surgical Application.*—The high frequency currents are utilized in surgery to produce such intense

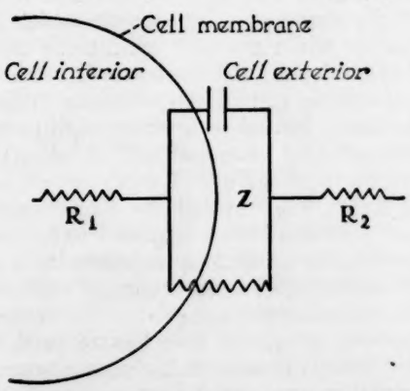

Fig. 9.—Electrical representation of a tissue: R_1, resistance of cell interior; Z, impedance of cell membrane; R_2, resistance of external fluid.

local heat that tissues are destroyed. Three different methods are available, each one having its own field of usefulness. In one of these methods a single electrode is used. The other two methods utilize one large "passive" electrode placed some distance from the other

7. Nernst, W.: Zur Theorie des elektrischen Reizes, Arch. f. d. ges. Physiol. (Pfluger's) **122**: 275, 1908.

8. Gildemeister, M.: Elektrische Energie (Elektrobiologie), Handbuch d. norm. u. path. Physiol. **8**: 693, 1928. McClendon, J. F.: Colloidal Properties of the Surface of the Living Cell: II. J. Biol. Chem. **69**: 733 (Aug.) 1926.

9. Fricke, H.: The Electric Capacity of Suspensions of Red Corpuscles of a Dog, Physiol. Rev. **26**: 682, 1925.

10. Kovacs, Richard: Electrotherapy, Philadelphia, Lea & Febiger, 1931. Stewart, H. E.: Physiotherapy, New York, Paul B. Hoeber, 1929. Stewart, H. E.: Diathermy with Special Reference to Pneumonia, New York, Paul B. Hoeber, 1923. Granger, F. B.: Physical Therapeutic Technique, Philadelphia, W. B. Saunders Company, 1929. Grover, B. B.: High Frequency Practice, Kansas City, Mo., Electron Press, 1931. Bucky, G.: Diathermiebehandlung, Berlin, Urban & Schwarzenberg, 1921.

"active" electrode and preferably on the opposite surface of the body to the area treated. The current entering the tissues from the small active electrode rapidly spreads out on its way to the large passive electrode. The heat produced in the tissues is therefore very concentrated near the active electrode, rapidly decreasing in intensity (though not in total amount) farther down.

(*a*) Electrodesiccation (or fulguration): This is the name usually designated to the one-electrode method. A fairly high voltage is needed and is obtained by means of an additional coil with many loops acting as a step-up transformer. This coil is either attached to one end of the ordinary inductance coil of the machine (Oudin current, fig. 5) or placed inside the coil (Tesla current). The electrode is in the shape of a needle and is handled in such a way that sparks jump to the tissues, which are destroyed by the heat thus produced. Very superficial destruction is obtained in this way. The method is used for such purposes as the removal of warts, moles or hemangiomas, and also in certain types of bladder tumors.

(*b*) Electrocoagulation: Electrocoagulation is a two-electrode method with the active electrode usually in the shape of a small metal ball or plate (perhaps 1 inch in diameter). This electrode is pressed against the tissues, which are gradually coagulated as the heat increases while the current passes through them. The depth to which the destruction extends depends on the density of the current, the length of time it is applied, and the sensitivity of the cells to heat, more sensitive cells being destroyed over a larger zone. This selective action on certain cells is considered of value in the treatment of certain cancerous growths. The completely desiccated tissues are scraped away. This method is especially useful for removal of large ulcerating malignant growths. Smaller blood vessels are sealed by the coagulation and bleeding is therefore much reduced.

(*c*) Electric Cutting Current: The electric cutting current also utilizes two electrodes. The active electrode is in the shape of a dull needle which is moved along smoothly while pressed against the tissues. A current of great density at the surface is used. A sharp cut results, probably caused by explosions of the cells as they are suddenly heated to a rather high temperature. A certain amount of coagulation also takes place and helps to reduce the bleeding. Larger vessels are sealed by passing the current through the hemostatic forceps. The vacuum tube machine is assumed to be most suitable for this type of operation, undoubtedly because the undamped current is of even intensity while the active electrode is being moved along. As this is the type of current used in radio, one firm has adopted the name "radio-knife" for the machine it manufactures. The cutting current is often used for removal of malignant growths. The advantage of this tool over the ordinary scalpel in such operations is the reduced bleeding and the diminished chance of transplantation of cancer tissues, as all cells touched by the electrode are immediately killed by the intense heat. The cutting current has been found useful in brain surgery also. It helps in minimizing the loss of blood. As the operative field is kept relatively free from blood the structures are well visualized and the operation can therefore be speeded up.

(*d*) Requirements of a Surgical Diathermy Machine: The main requirement for electrodesiccation is a high voltage so that a spark of several millimeters length can be obtained. That is why a separate coil consisting of many turns of fine wire is used in the high frequency side. A small current is needed and the maximum amount that can be obtained from this circuit usually lies below one ampere. Machines can be bought without this special coil and it should be ascertained before it is acquired whether or not it is equipped for electrodesiccation.

A current suitable for coagulation does not, as a rule, cut well, and vice versa. It seems that a rather small current is needed for cutting and the undamped current from a vacuum tube machine has proved excellent for this purpose. However, lately spark machines have been constructed with a very satisfactory cutting current.

According to some unpublished investigations by I. Chalek, who used a cathode ray oscillograph to study the characteristics of the current, the following points seem to be essential: The machines must be equipped with a separate circuit which permits the use of a high "spark-frequency." The current is less damped than in ordinary diathermy machines and the frequency is relatively low. The voltage available at open circuit ought to be quite high so that current can be obtained when the resistance of the tissues is high, but the internal resistance of the circuit should also be fairly high so that the current does not increase too much when the tissue resistance is low. The current needed is, as a rule, below one ampere and the voltage drops down very much when the circuit is closed. For coagulation a blunt electrode with considerable surface contact is used and a current of several amperes is often needed.

During an operation it is often necessary to switch over repeatedly from cutting to coagulation and vice versa, and it is therefore important to use a machine that delivers both types of current in a satisfactory manner. It is advisable to test both the cutting and the coagulation current of a new machine before it is accepted.

3. *Is the Current Registered by the Diathermy Ammeter the True Heating Current?*—A few years ago d'Arsonval [11] made the rather startling statement that the current as measured by the diathermy ammeter was not the true heating current. Such a statement was contrary to the earlier beliefs based on the work of Nesper.[12] D'Arsonval contended that the human tissue between the metallic electrodes behaved like the dielectric of a condenser and the system was electrically similar to the scheme of figure 3. He supported his argument by calorimetric measurements of the heat production in solutions and showed that for solutions of high resistance there was little heating effect. Hemingway,[13] however, measured the high frequency resistance of patients undergoing a diathermy treatment and showed that the resistances of the patients varied from 20 to 200 ohms. Using solutions of these resistances, he showed that the heat production could be computed from the current and resistance in accordance with Joule's law. The diathermy current as measured by the ammeter is the true heating current, and d'Arsonval had used for his model solutions of resistances far too high to represent a patient in a diathermy treatment. If one computes the capacity of a condenser consisting of the electrodes and the patient in an actual treatment, it can readily be shown that this capacity is much too

11. d'Arsonval: L'échauffement des tissus par les courants de haute frequence, Compt. rend. Acad. d. sc. **185**: 324, 1927.
12. Nesper, E.: Warmernwirkung durch Hochfrequenzstrom in organischen Geweben (Thermopenetration), Physik. Ztschr. **11**: 20, 1910.
13. Hemingway, A.: Thermal Effects of Diathermy, Radiology **14**: 99 (Feb.) 1930.

small to "short circuit" any appreciable amount of the current passing through the ammeter.

4. *Diathermy Voltage.*—The term diathermy voltage has been used in a somewhat loose way. It has often been claimed that "better results," whatever they may be, are obtained with so-called high voltage machines.

There are two types of diathermy voltage, the "peak" voltage and the effective voltage. The peak voltage is the highest instantaneous value which the voltage reaches in its course. In the spark machine it is the voltage corresponding to the highest current value *D* of figure 6. For the vacuum tube type the peak voltage corresponds to the value *E* (fig. 6). Widening the spark gaps or placing more of them in a circuit increases this peak voltage.[14] The effective voltage is by definition "the square root of the average of the squared values." A true average of an alternating voltage would be zero; hence the necessity of the squared values. The effective voltage in simpler terms is that voltage which is the driving force of the diathermy current. Although the voltage varies through a wide range of values in its alternations there is a representative value which would produce the same heating effect in a pure resistance as a direct current voltage. This is measured with a thermocouple voltmeter, which is similar to the thermocouple ammeter already described. Methods of measuring both the peak and the effective voltage are given by Hemingway.[14]

It has been found that by increasing the effective voltage the diathermy current is increased. Varying the peak voltage by widening the spark gaps while keeping the diathermy current constant (i. e., by adjusting *K* in figure 5 at the same time) does not change the value of the heat production. Hence the peak voltage variation; that is, a high peak voltage or low peak voltage, as determined by the spark gaps, is immaterial. The deciding factor of heat production is the current which for any one setting of the electrodes varies proportionally to the effective voltage.

5. *Efficiency of a Diathermy Machine.*—In a diathermy treatment, electrical energy is converted into heat energy in the patient. It is interesting to know just what fraction of the input energy is imparted to the patient as heat energy. Hemingway[13] has shown that, with a diathermy machine using spark gaps and condensers similar to the small Victor machines, approximately 50 per cent of the electrical energy put into the machine is converted to heat in the tissues of the patient, provided the spark gaps are not too wide.

6. *Measurement of Heat Imparted to the Patient in Diathermy.*—In a diathermy treatment the only measurable quantity is the current traversing the patient. This tells the physical therapist nothing concerning the amount of heat which the patient receives. It is of considerable interest for physiologic purposes to be able to measure the heat production (in calories) in the tissues by the high frequency current.

Hemingway,[15] on passing a high frequency current through tissues, showed that at high frequency the tissue behaved as a simple resistance and was heated according to Joule's law. According to this law the heat production in calories is

$$\text{Heat} = 0.24\ I^2\ Rt = 0.24\ VIt \text{ calories.}$$

where *I* is the current passing through the tissue, *R* is the resistance and *V* is the voltage drop across the tissue, and *t* is the duration time of the treatment. The recently developed thermocouple voltmeter was used to measure the effective voltage drop, and it was shown that the heat produced could be computed from the voltage reading and the value of the current, a simple procedure. It may be added that this method is possible only on account of the fortunate characteristics that the polarization and membrane impedances already mentioned are negligible with high frequency current.

Any operator of a diathermy machine can measure the heat imparted to the patient. To do this the effective voltage drop across the patient is measured with a thermocouple voltmeter. The diathermy current *I* in amperes is read and the duration time (seconds) of the experiment. The heat in calories is then the product 0.24 *IVt* calories. Recently there has been designed a wattmeter whose reading gives the rate of heat production. A voltage and current reading are not necessary when a wattmeter is used. The heat production as computed from the wattmeter and from the voltage-current readings gives identical results. It may be added that, if a wattmeter is used, one cannot dispense with an ammeter. This is necessary in every machine to regulate the electrode dosage—that is, the number of milliamperes per square inch or per square centimeter must be below a certain critical value to prevent electrode burns.

7. *Distribution of Heat in Diathermy.*—This is an important problem clinically, when the heating of some particular region is desired. The diathermy current flows from one electrode to the other through the tissues. On its passage it avoids the tissues of high resistance and chooses the tissues of least resistance. For this reason it is important to know the values of the specific resistance of each particular tissue. Wildermuth and Bachem[16] measured these specific resistances from cadavers, by means of a calorimetric method. Wildermuth's experiments indicate that bone and fat have high specific resistances; hence these tissues, when possible, will be avoided by the high frequency current, which will follow the low resistant tissues as muscle and blood.

There is one instance, however, in which the current cannot avoid the high resistance fat. This is on the skin where the electrode is applied. The diathermy current, in order to reach the deeper tissues, must traverse the layer of subcutaneous fat; and, since the heat production is given by resistance multiplied by the squared value of the current, there will be considerable heat production in this layer, owing to the high resistance of the fat. In many cases in which relatively small electrodes are used, the current is concentrated in a small section of this subcutaneous layer and, because of the high resistance, burns result. For this reason the diathermy dosage is regulated to be less than 20 milliamperes per square centimeter or 100 milliamperes per square inch of the smallest electrode.

Bordier[17] and Simon[18] have observed apparently different surface heating effects with the two common types of diathermy electrodes, these being the saline pad and the block tin electrode. Hemingway and

14. Hemingway, A.: Peak Voltage Measurement in Diathermy, Radiology **15**: 670 (Dec.) 1930.
15. Hemingway, A.: Quantitative Measurement of Diathermy Dosage, Radiology **17**: 136 (July) 1931.
16. Wildermuth, F.: Experimentelle Untersuchungen über den spezifischen Leitungswiderstand und über die spezifische Warme der Gewebe des menschlichen Körpers als Grundlage für die Beurteilung des Weges von Warmeeregenden hoch Frequenzströmen, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **22**: 511, 1911. Bachem, A.: Arch. Physical Therapy **11**: 391 (Aug.) 1930.
17. Bordier, H.: Sur la chaleur dégegée par la d'arsonvalisation diathermique au moyen d'électrodes spongieux: graves inconvenients de ces électrodes, Compt. rend. Acad. d. Sc. **186**: 540 (Feb. 20) 1928.
18. Simon, G.: Relative Efficiency of Pads Moistened with Saline Solution and Lead Plates as Electrodes with Diathermy Currents, Brit. J. Radiol. **2**: 242 (May) 1929.

Collins [19] and Hemingway and Hansen,[20] using thermocouple needles in the subcutaneous tissue and working on animals and human beings, respectively, have shown that there is a much greater surface heating with metallic electrodes if the treatment is of short duration; i. e., twenty minutes. With longer treatments (one hour) the surface temperature of both types of electrodes tend to become equal. Stenstrom and Nurnberger [21] have observed that the surface temperature rises to a maximum after from twenty to thirty minutes and then drops a little and remains constant as the treatment is prolonged.

Measurement of temperatures in the deeper organs at some distance from the electrodes has been accomplished by placing thermocouples [22] or resistance thermometers [23] in the body cavities. In general, there is very little increase in temperature of the deep tissues. Binger and Christie [24] noted a rise in the temperature of the lungs on suddenly increasing the current. This temperature rise persisted, however, for only a short time. Their experiments indicate the important rôle of the blood circulation as a means of equalizing local temperatures.

8. *Skin Effects.*—Many people seem to take the term "skin effect" literally and believe that a high frequency current is conducted over the surface of the body. This is an entirely erroneous impression and without physical confirmation. According to the theory of the nineteenth century physicists, notably Rayleigh and Maxwell, a high frequency current flowing along a metallic wire is concentrated at the periphery. However, if one takes the mathematical expressions of these physicists and applies them to electrolytic conductors,[25] it can readily be shown that there is no such surface accumulation of the current. The reason this effect is important in metals and not in electrolytes is that the specific resistance of metals is very small in comparison with electrolytes. It may be said, then, that with human tissues at diathermy frequencies, skin effect is negligible.

9. *Requirements of a Diathermy Machine for Clinical Use.*—In the purchase of a diathermy machine, many physicians are bewildered by the wild and extravagant claims of salesmen of these machines, who claim advantages for "high frequency," "high voltage" or "vario frequency." To substantiate these claims there is no physical, physiologic or medical evidence. The requirements of a suitable machine are few when one considers that the aim of a diathermy treatment is heat production without electrical stimulation.

One requirement of a diathermy machine is that it must be capable of transferring a sufficient amount of heat energy to the patient. If a general treatment is to be given, where the entire body temperature is to be raised, i. e. an "artificial fever" is to be produced, a powerful machine is necessary. The power output is regulated by the low frequency transformer (*T*, fig. 5). In local diathermy treatments of bruises, sprains, joints or extremities, less energy is required and a smaller machine is sufficient. In demonstrations of machines, it is often customary to pass a diathermy current between two electrodes, one in each hand. In this case the current path through the body is long, the resistance is high and a machine with a large energy output is necessary to produce a sufficient current for rapid heating. Conditions are quite different from those of most local treatments where the resistance is low.

Another important requirement is that the patient shall feel no electrical shock. The frequency of the machine must be in the diathermy range; that is, between 500 and 3,000 kilocycles. Placing a patient in a circuit as shown in figure 5 increases the frequency,[13] so that if the "open circuit frequency," i. e., frequency of the machine without the patient or a substitute, is in the diathermy range it may be used without fear of electrical shock. One possibility is that a patient might feel a shock due to the sixty cycle current applied to the condensers. There is less possibility of this in machines equipped with two series condensers, as shown in figure 4, since this increases the impedance to the sixty cycle current.

SHORT WAVE THERAPY (RADIOTHERMY)

1. *Methods.*—There is a new type of high frequency therapy now in the experimental state of development, which may become clinically important in the next few years. This is the use of an "ultra high frequency field" or a "high frequency electrostatic field" or "short radio waves," according to the terminology of different experimenters. The patient or object to be heated is placed between the plates of a condenser, not in direct contact with the plates as with diathermy electrodes, but separated from the condenser electrodes by an air space. An alternating current is generated in an oscillating circuit, of which the condenser is a part, by means of a vacuum tube. The frequency is of the order of magnitude of from 10^7 to 10^8 cycles per second; that is, the alternations are from 10 to 100 times as rapid as those of diathermy. When large power tubes are used there is a rapid generation of heat in the tissues between the electrodes when a current is flowing.

The early experiments [26] were confined to heating solutions and small animals. Hosmer [26] has shown that certain frequencies heat certain solutions more rapidly than others, this heating depending on their conductivity. Schereschewsky [27] states that certain frequencies are specifically toxic to the living cell, but Christie and Loomis [28] and Kahler, Chalkley and Voegtlin [29] believe that the toxic effect is due to heat production only. The circuit used is the vacuum tube oscillating circuit. With such high frequencies the capacity and inductance of the oscillating circuit must be very small. Schliephake,[30] McKinley [31] and others have described in detail the apparatus used.

2. *Clinical Use.*—Schliephake,[30] after many preliminary experiments on solutions and animals, has placed limbs of human subjects between the condenser plates for heat treatment. He finds that the condenser plates

19. Hemingway, A., and Collins, D.: Temperature Distribution with Different Diathermy Electrodes, Arch. Physical Therapy **12**: 517 (Sept.) 1931.
20. Hemingway, A., and Hansen, C. O.: Temperature Distribution in Local Diathermy Treatments, Radiology **17**: 1258 (Dec.) 1931.
21. Stenstrom, Wilhelm; and Nurnberger, Paul: Effect of Diathermy Treatments on Temperature, Arch. Int. Med. **44**: 556 (Oct.) 1929.
22. Lonergan, R. C.: An Experimental Study of Diathermy, J. Indust. Hyg. **9**: 1 (Jan.) 1927.
23. Furstenberg, A., and Schemel, K.: Des Verhalten der Korper und Gewebstemperature des Menschen bei der Thermopenetration (Diathermie), Deutsche med. Wchnschr. **38**: 1780, 1912.
24. Binger, C. A. L., and Christie R. V.: General and Local Heat Developed in the Living Animal Body by Passage of High Frequency Currents, Proc. Soc. Exper. Biol. & Med. **24**: 677, 1927.
25. Richardson, D. E.: Resistance of an Electrolytic Conductor at Various Frequencies, Physiol. Rev. **35**: 297, 1930.
26. Hosmer, Helen R.: Heating Effects Observed in a High Frequency Static Field, Science **68**: 325 (Oct. 5) 1928.
27. Schereschewsky, J. W.: The Physiological Effects of Currents of Very High Frequency (135,000,000 to 8,300,000 Cycles per Second), Pub. Health Rep. **41**: 1939 (Sept. 10) 1926.
28. Christie, R. V., and Loomis, A. L.: The Relation of Frequency to the Physiological Effects of Ultra-High Frequency Currents, J. Exper. Med. **49**: 303 (Feb.) 1929.
29. Kahler, H.: Chalkley, H. W., and Voegtlin, Carl: The Nature and the Effect of a High Frequency Electric Field upon Paramecium, Pub. Health Rep. **44**: 339 (Feb. 15) 1929.
30. Schliephake, E.: Tiefen wirkungen im Organismus durch kurze elektrische Wellen, Ztschr. f. d. ges. exper. Med. **66**: 212, 1929.
31. McKinley, J. G., and McKinley, G. M.: High Frequency Equipment for Biological Experimentation, Science **71**: 508 (May 16) 1930.

must not touch the skin or burns will take place. Sparks are apt to occur where small drops of perspiration are formed. Carpenter and Page [32] describe the technic for the treatment of patients in cases in which the general body temperature is raised; that is, the production of an artificial fever. They cite twenty-five successful treatments with no ill effects.

3. *Diathermy Versus Short Wave Therapy.*—The experiments on short wave treatments are too recent and incomplete to permit any final conclusions. There are, however, a few interesting points that are worthy of notice. One question that will be raised by the medical profession is this: Is the new type of heat therapy better than diathermy?

Schliephake [30] has shown, at least for amputated limbs, which, devoid of circulation, are only approximately representative of the actual physiologic conditions, that there is a more even distribution of heating in short wave therapy than in diathermy. As is well known to physical therapists, the greatest heating effect of diathermy is at the electrodes (unless the current passing between the electrodes passes through a constricted current path, as the longitudinal treatment of a joint). Furthermore, the diathermy current, if possible, avoids the tissues of high resistance, such as bone. Consequently, the heat distribution is uneven. Schliephake [30] has shown that bone (marrow cavity) is heated to a much greater degree with less superficial heating with this new method. Selective heating of some fluids in the body may also take place for certain frequencies.

The technic of the new treatment, however, is much more involved. The dosage is difficult to regulate, as the ammeter gives only a rough approximation of the heating effect. It is not possible to compute the heat dosage in calories from instrument measurements. Temperature measurements are difficult.[28] The usual thermocouples or thermometers cannot be used when the current is flowing.

The most careful observers attribute the effects of the short wave electrical fields solely to heat production.[33] The very fact that diathermy has proved quite satisfactory from a clinical point of view, owing to its ease of manipulation and its freedom from technical injuries, makes it highly improbable that it will ever be replaced by a technic that is much more complicated, is more liable to produce accidents from carelessness and produces the same physiologic result, the production of heat in the tissues. However, future experimentation may discover some particular specific beneficial effect which will make this type of therapy valuable to the physical therapist.

The present report cannot go into numerous details and cannot give complete explanations of all the physical processes involved in the clinical use of high frequency currents. Many of the books on physical therapy contain a brief introductory section on the physics of physical therapy. Usually this is incomplete and in many cases contains wrong statements which have been accepted by leading physical therapists at reputable clinics. The more recent books seem to be better in this respect. As an example may be mentioned "Electrotherapy and Light Therapy" by Richard Kovacs, recently published by Lea and Febiger in Philadelphia. It contains a good detailed account of the fundamental physics of high frequency currents.

32. Carpenter, C. M., and Page, A. B.: The Production of Fever in Man by Short Radio Waves, Science **71**: 450 (May 2) 1930.
33. Christie and Loomis (footnote 28). Knudson, Arthur; and Schaible, P. J.: Physiologic and Biochemical Changes Resulting from Exposure to an Ultra High Field, Arch. Path. **11**: 728 (May) 1931.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

SEGO UNSWEETENED EVAPORATED MILK

Manufacturer.—Sego Milk Products Company, Subsidiary of Pet Milk Company, St. Louis.

Description.—An unsweetened evaporated milk.

Manufacture.—Fresh whole milk from healthy cows is used; the sanitary conditions of collection, handling, cooling and transportation are under strict supervision. The milk is tested for cleanness, freshness and flavor before acceptance.

The milk is heated in jacketed hot wells to approximate boiling, conveyed to "vacuum" pans where from 50 to 60 per cent of the water is removed at from 48 to 54 C. and is homogenized by being forced through small apertures under high pressure, which finely disperses the fat so as not to separate out on storage. It is cooled to 2 C., agitated in glasslined tanks, and tested for fat and total solids to assure conformity to the United States Department of Agriculture standard for evaporated milk. The tested milk is canned by injecting into the cans through small openings which are automatically sealed. The filled cans are sealed and processed in retorts at from 115 to 121 C. for twenty minutes, which accomplishes sterilization and favorably affects the viscosity. The cooled cans are stored for several days in a warm room. Any defective or improperly processed cans are discarded.

Analysis (submitted by manufacturer).—

	per cent
Total solids	25.5–26.5
Ash	1.5– 1.6
Fat (ether extract)	7.8– 8.2
Protein (N × 6.38)	7.0– 8.2
Lactose (by difference)	9.5–10.0

Calories.—1.4 per gram; 40 per ounce.

Micro-Organisms.—The product is sterile.

Claims of Manufacturer.—Sego evaporated milk is suitable for general cooking, baking and table uses and for infant feeding. The mixture of equal parts of the evaporated milk and water is not below the legal standard for whole milk. The curds formed in the stomach are smaller, softer and more readily digestible than those from raw or pasteurized milk.

WHITE PEARL MACARONI, SPAGHETTI, CUT SPAGHETTI, AND TASTY BENDS MACARONI

Manufacturer.—Tharinger Macaroni Company, Milwaukee.

Description.—Macaroni and spaghetti prepared from durum patent flour and durum semolina; wax-paper wrapped in cartons.

Manufacture.—Durum flour and semolina with sufficient water are thoroughly mixed in a "dough mixer," kneaded in a kneading machine, transferred to pressure cylinders, and forced through dies to produce the desired form or shape. The material is dried in air currents to approximately 10 per cent moisture content.

Analysis (submitted by manufacturer).—

	per cent
Moisture	11.4
Ash	0.7
Sodium chloride	0.0
Fat (acid hydrolysis method)	1.8
Protein (N × 5.7)	12.8
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	73.0

No added color.

Calories.—3.6 per gram; 102 per ounce.

Claims of Manufacturer.—These macaroni and spaghetti products are for all table uses for this type of product.

BOWMAN'S HOME LEADER BREAD

Manufacturer.—A. Bowman & Son, Roanoke, Va.

Description.—A white bread made by the sponge dough method.

Manufacture.—The sponge dough ingredients, short patent flour of southwest wheat, water, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The sponge dough is fermented for from four to five hours, after which are added flour, water, salt, sucrose, sweetened condensed skim milk, shortening and pure sweet cream to make the completed dough, which is cut into pieces of desired weight. The pieces are fermented for a short time, molded into loaf form, panned, further fermented, baked for from thirty to thirty-five minutes, cooled, and wrapped in wax-paper.

The factory, equipment and storage rooms are kept in strictly sanitary condition.

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	37.5
Ash	1.7
Fat (ether extract)	3.5
Protein (N × 6.25)	8.4
Crude fiber	0.4
Carbohydrates other than crude fiber (by difference)	48.5

Calories.—2.6 per gram; 74 per ounce.

Claims of Manufacturer.—A bread of good quality.

RED STAR SHORT PATENT FLOUR (BLEACHED)

Manufacturer.—The Red Star Milling Company, Wichita, Kan., Associate Company of General Mills, Inc., Minneapolis.

Description.—A moderately "strong" patent flour for general baking purposes in the home.

Manufacture.—See this section for Gold Medal "Kitchen-Tested" Flour (THE JOURNAL, Oct. 3, 1931, p. 1002).

Analysis (submitted by manufacturer).—

	per cent
Moisture	13.0 –14.5
Ash	0.38– 0.44
Fat (ether extract)	0.8 – 1.2
Protein (N × 5.7)	9.5 –10.5
Crude fiber	0.3 – 0.5
Carbohydrates other than crude fiber (by difference)	76.0 –72.9

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—An "all purpose" flour for use in home baking; standardized in baking characteristics for uniform performance under normal home baking conditions.

HARVEST HOME BRAND GOLDEN TABLE SYRUP

Packer.—D. B. Scully Syrup Company, Chicago.

Distributors.—Jett and Wood Merc. Co., Hutchinson, Kan.; Jett and Wood Cen. Merc. Co., Wichita, Kan.

Description.—A table syrup; a corn syrup flavored with refiners' syrup.

Manufacture, Analysis, Calories, Claims of Manufacturer.—See these sections for Banner Blue Corn Syrup with Cane Flavor (THE JOURNAL, March 5, 1932, p. 817).

REPORTS OF THE COMMITTEE

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

RAYMOND HERTWIG, Secretary.

"KING'S MAELUM" NOT ACCEPTABLE

"King's Maelum," manufactured by Kings Laboratories, Inc., Calimesa, Calif., was submitted to the Committee on Foods in November, 1930, by Arthur R. Maas, Professor of Pharmaceutic Chemistry of the University of Southern California and the head of the Arthur R. Maas Laboratories, Los Angeles. King's Maelum is a clarified, concentrated apple juice, containing in large degree the mineral salts and fruit sugars of apples. It sells for $5.00 a quart. When the product was submitted the Committee was told that the Maas Laboratories was awaiting the approval of the federal Food and Drug Administration of a revised label and circular embodying certain changes and that the label and circular were, therefore, not yet ready to send to the Committee. The Maas Laboratories did, however, submit certain general information on King's Maelum, to the effect that it was a "derivative of apples" that was "prepared from delicious sun-ripened California fruit by a special process"; that it was "not a medicine but a friendly food"; that it does "not replace ordinary foods but supplements them"; that the mineral salts in it are "chiefly compounds of the alkalies with malic acid," which malic acid would be digested when taken into the body, "leaving the alkalies free to enter the blood," and finally that it was prescribed by many physicians "for certain conditions."

Later, the Maas Laboratories wrote to the Committee, stating that the federal Food and Drug Administration had "approved the text of the label for King's Maelum" but that there were still under discussion with the federal authorities some claims in the circular. Still later, the Committee was notified by the Arthur R. Maas Laboratories that the "federal food and drug administration has now approved the circular which is to accompany each package of King's Maelum." As a matter of fact, as the letter which the Maas Laboratories had received from the United States Department of Agriculture showed, the government had not formally approved the circular. What the officials had actually said was: "The circular you now submit . . . does not contain *many* [Italics ours—ED.] of the statements to which we referred as objectionable." The officials also added that "the manufacturer must assume the whole responsibility for *all* [Italics again ours—ED.] statements made in this material."

Then followed considerable correspondence between the Committee and the Maas Laboratories, relative to certain statements regarding composition and particularly as to a description of the product. Finally, the Committee, was notified that all of the changes required by it had been made and the Committee was furnished corrected copies of the new label and advertising circular, and it was agreed that the company would meet all the Committee's requirements. On Oct. 27, 1931, the Secretary of the Committee on Foods wrote to the Arthur R. Maas Laboratories that King's Maelum was being accepted by the Committee and that an announcement of acceptance for the product would be furnished in the near future for review and criticism, before its publication in THE JOURNAL.

A day or two following the Secretary's letter of acceptance, it was brought to the attention of the Committee on Foods that King's Maelum had been advertised for the past year or so and even in the very recent past under crude "patent medicine" claims; that King's Maelum had been recommended in diphtheria and all contagious diseases, in disorders of the urinary tract (contagious or not contagious), as a vaginal douche, in the treatment of peritonitis, tonsillitis and bronchitis, in the treatment of both hypertension and hypotension, in the treatment of syphilitic and other ulcers, etc.

On Nov. 9, 1931, the Bureau of Investigation of the American Medical Association turned over to the Committee on Foods four pieces of advertising material that had been given to a physician in Long Beach, Calif., by the local office of King's Maelum as late as November 4, that is, eight days after the Committee had notified the Maas Laboratories of the product's acceptance. Some of this advertising material was of the crude nostrum-exploitation type previously referred to. As a result of the submission of this material to the Committee, on the same day (November 9) the Secretary of the Committee sent a telegram withdrawing acceptance of the product.

Later correspondence, both with the manufacturer and with the Maas Laboratories, developed the fact that the manufacturer seemed to be unable to control the methods of advertising for the product. The president of Kings Laboratories, Inc., Mr. H. R. Sheppard, wrote under date of Dec. 29, 1931, that their national distributor, although appreciating the value, from a commercial point of view, of the Seal of Acceptance of the Committee on Foods, "does not believe that it is possible for him to so conduct his business as to continuously retain the seal; due to the number of distributors who are at this time representing him. . . ."

In view of the fact that the manufacturer apparently admits he is unable properly to control the advertising and maintain it in conformity with the Committee's requirements, King's Maelum will not be listed among the Committee's "accepted" foods.

MEDICAL LICENSURE STATISTICS FOR 1931

ANNUAL PRESENTATION OF STATE BOARD STATISTICS BY COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION, INCLUDING STATISTICS OF BASIC SCIENCE BOARDS AND THE NATIONAL BOARD OF MEDICAL EXAMINERS

The medical licensing boards of all states, District of Columbia, Alaska, Canal Zone, Hawaii and Porto Rico contributed official reports for the compilation of the data presented here. Included in these statistics are figures from the five homeopathic boards (Arkansas, Connecticut, Delaware, Louisiana and Maryland) and from the eclectic board of Arkansas. In the latter part of the report are figures from the seven basic science boards (Arkansas, Connecticut, District of Columbia, Minnesota, Nebraska, Washington and Wisconsin) and the National Board of Medical Examiners. Every effort has been made to insure accuracy. The officers of the examining boards deserve much praise for the completeness of their reports. In the publication of these statistics, the endeavor has been to show the actual facts, a knowledge of which is always beneficial. The information published herewith should be of service to medical colleges and state licensing boards, as well as to the public.

TOTAL REGISTRATION

During 1931, 7,309 physicians and 125 osteopaths were licensed to practice medicine and surgery, 8 osteopaths to practice osteopathy and surgery and 1 to practice osteopathy and medicine in the United States and its territories. The licenses of 47 physicians have been withheld pending completion of their hospital internship (23), for citizenship (10), presentation of M.D. degree (5), fees (4), definite residence intention (4) and postage (1). The methods by which these candidates were certified are described in the following paragraphs.

A comparison of the number of candidates registered in each state by examination, reciprocity and endorsement is shown in table 1. This table shows also the numbers registered by these methods who were graduates of medical, nondescript and class C, and osteopathic schools. There were 5,224 candidates licensed by examination, as compared with 2,219 by reciprocity and endorsement. Twenty were registered by "special exemption." Two of these were in Connecticut, one licensed by the regular board for his outstanding work in another state and one by the homeopathic board on years of practice by special provision of the medical practice act; one in Florida practiced medicine in that state prior to creation of the medical practice act; fourteen in New York on the basis of their diplomas and one by special consideration of the New York Board of Regents; in Rhode Island one osteopath was granted a certificate to practice general surgery on completing one year of postgraduate internship, and one physician was licensed in Vermont for his outstanding work in the Dominican Republic.

CANDIDATES EXAMINED

Table 2 gives the results (passed and failed) for all candidates who took examinations in 1931. There were 5,576 candidates examined, of whom 5,224 passed and 352 failed (6.3 per cent). These candidates came from 64 approved medical colleges in the United States, 9 Canadian medical schools, 56 foreign medical colleges, 7 nondescript—Class C, osteopaths, undergraduates or graduates of unrecognized—colleges, and from 24 miscellaneous colleges—institutions now out of existence.[1] There were 162 Canadian graduates examined, 12.3 per cent of whom failed, and 158 foreign graduates, of whom 42.4 per cent failed. Of the 146 osteopaths examined for licenses to practice as physicians and surgeons, 100 passed; of 118 graduates of unrecognized medical schools, 57 passed and 1 undergraduate failed.

TABLE 1.—*Registration by State Boards—1931*

State	Examination				Reciprocity and Endorsement					Total Registered
	Graduates of Medical Schools	Undergraduates	Graduates of Class C and Nondescript Colleges	Osteopaths	Graduates of Medical Schools	Undergraduates	Graduates of Class C and Nondescript Colleges	Osteopaths	Special Exemption	
Alabama	29	0	0	0	21	0	0	0	0	50
Arizona	20	0	0	0	28	0	0	0	0	48
Arkansas	28	0	1	0	16	0	0	0	0	45
California	315	0	0	58	191	0	2	3	0	569
Colorado	38	0	0	10	25	0	0	0	0	73
Connecticut	64	0	0	2	42	0	0	0	2	110
Delaware	12	0	0	0	5	0	0	0	0	17
District of Columbia	27	0	0	0	6	0	3	0	0	36
Florida	55	0	0	0	0	0	0	0	1	56
Georgia	77	0	0	0	14	0	0	0	0	91
Idaho	5	0	0	0	18	0	0	0	0	23
Illinois	331	0	33	0	96	0	0	0	0	460
Indiana	124	0	0	0	43	0	0	0	0	167
Iowa	108	0	1	0	65	0	1	0	0	175
Kansas	74	0	0	0	41	0	0	0	0	115
Kentucky	64	0	0	0	33	0	1	0	0	98
Louisiana	102	0	0	0	10	0	0	0	0	112
Maine	30	0	0	0	11	0	0	0	0	41
Maryland	153	0	0	0	16	0	1	0	0	170
Massachusetts	170	0	23	21	41	0	0	0	0	255
Michigan	260	0	0	0	97	0	0	0	0	357
Minnesota	150	0	0	0	20	0	0	0	0	170
Mississippi	35	0	0	0	18	0	0	0	0	53
Missouri	157	0	0	0	44	0	0	0	0	201
Montana	7	0	0	0	3	0	0	0	0	10
Nebraska	57	0	0	0	17	0	0	0	0	74
Nevada	2	0	0	0	19	0	1	0	0	22
New Hampshire	6	0	0	0	29	0	0	0	0	35
New Jersey	91	0	0	0	197	0	2	0	0	290
New Mexico	0	0	0	0	35	0	2	0	0	37
New York	838	0	0	0	251	0	1	0	15	1,105
North Carolina	74	0	0	0	29	0	1	0	0	104
North Dakota	16	0	0	0	7	0	0	0	0	23
Ohio	259	0	0	0	125	0	0	0	0	384
Oklahoma	51	0	0	0	29	0	0	0	0	80
Oregon	40	0	0	0	24	0	0	0	0	64
Pennsylvania	418	0	1	0	51	0	0	0	0	470
Rhode Island	36	0	0	0	6	0	0	0	1	43
South Carolina	47	0	0	0	7	0	0	0	0	54
South Dakota	16	0	0	0	25	0	0	0	0	41
Tennessee	197	0	1	0	26	0	0	0	0	224
Texas	149	0	0	5	140	0	4	27	0	325
Utah	9	0	0	0	16	0	0	0	0	25
Vermont	20	0	0	0	4	0	0	0	1	25
Virginia	101	0	0	0	36	0	0	0	0	137
Washington	31	0	0	2	31	0	0	0	0	64
West Virginia	36	0	0	0	24	0	0	0	0	60
Wisconsin	96	0	0	2	97	0	1	0	0	196
Wyoming	5	0	0	0	14	0	0	4	0	23
U. S. Territories and Possessions	34	0	0	0	1	0	1	0	0	36
Totals	5,064	0	60	100	2,144	0	21	34	20	7,443
	5,224				2,219					

(CONTINUED ON PAGE 1460)

1. There are seventy-six medical schools in the United States approved by the Council on Medical Education and Hospitals of the American Medical Association. Nine of them give only the first two years of the medical course. Thus, the University of Southern California School of Medicine, University of Missouri School of Medicine and Duke University School of Medicine, have not as yet had graduates.

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 Arkansas P	3 Arkansas F	4 California P	4 California F	5 Colorado P	5 Colorado F	6 Connecticut P	6 Connecticut F	7 Delaware P	7 Delaware F	8 Dist. Columbia P	8 Dist. Columbia F	9 Florida P	9 Florida F	10 Georgia P	10 Georgia F	11 Idaho P	11 Idaho F	12 Illinois P	12 Illinois F	13 Indiana P	13 Indiana F	14 Iowa P	14 Iowa F	15 Kansas P	15 Kansas F	16 Kentucky P	16 Kentucky F	17 Louisiana P	17 Louisiana F	18 Maine P	18 Maine F	19 Maryland P	19 Maryland F	20 Massachusetts P	20 Massachusetts F	21 Michigan P	21 Michigan F	22 Minnesota P	22 Minnesota F	Marginal Number
	ARKANSAS																																													
1	University of Arkansas School of Medicine			1	0	27	0											4	0															1	0											1
	CALIFORNIA																																													
2	College of Medical Evangelists			1	0			52	1							2	0	2	0																			2	0	1	0	1	0	1	0	2
3	Stanford University School of Medicine			1	0			49	0																													1	0							3
4	University of California Medical School							54	0																																					4
	COLORADO																																													
5	University of Colorado School of Medicine	1	0					10	0	31	0																	1	0	1	0															1	0	5
	CONNECTICUT																																													
6	Yale University School of Medicine											8	0			1	0																	1	0			1	0	1	0			1	0	6
	DISTRICT OF COLUMBIA																																													
7	Georgetown University School of Medicine											5	2	1	0	8	0																					13	0	9	0			1	0	7
8	George Washington University School of Medicine											1	0			9	0																	1	0			11	0							8
9	Howard University College of Medicine													1	0	1	0			6	0			1	0					2	0			2	0			11	2							9
	GEORGIA																																													
10	Emory University School of Medicine	4	0					0	1									8	0	32	0			1	0													1	0							10
11	University of Georgia Medical Department																	4	1	27	0													1	0											11
	ILLINOIS																																													
12	Loyola University School of Medicine							4	0			1	0											70	9	4	0	3	0					1	0							2	0	1	0	2
13	Northwestern University Medical School	2	0	2	0			25	0									1	0	1	0	2	0	54	2	4	0			3	0			3	0					1	0	3	0	4	0	13
14	University of Chicago, Graduate School of Medicine of the Division of Biological Sciences																							1	0																					14
15	University of Chicago, Rush Medical College	4	0	2	0			11	0	2	0	1	0			1	0	1	0	1	0			82	0	5	0	2	0			2	0	1	0			1	0	1	0	3	0	1	0	15
16	University of Illinois College of Medicine			3	0			8	1													1	0	94	1	1	0					1	0					3	0	1	0	1	0	16
	INDIANA																																													
17	Indiana University School of Medicine			1	0			1	0															2	0	102	0											1	0					2	0	17
	IOWA																																													
18	State University of Iowa College of Medicine							2	0													1	0					90	0									1	0					4	0	18
	KANSAS																																													
19	University of Kansas School of Medicine			1	0			1	0																					50	0			2	0											19
	KENTUCKY																																													
20	University of Louisville School of Medicine			3	0			1	0			1	0													1	0					58	1	1	0									20
	LOUISIANA																																													
21	Tulane University of Louisiana School of Medicine	11	0					2	0									5	0															60	0									2	0	21
	MARYLAND																																													
22	Johns Hopkins University School of Medicine							2	0	1	0	3	0									1	0	2	0									1	0	1	0	38	0	1	0	2	0	1	0	22
23	Univ. of Md. School of Med. & College of P. & S.			1	0							2	0			1	0	1	0																	50	0							23
	MASSACHUSETTS																																												
24	Boston University School of Medicine											4	0					1	0																	5	0			22	2					24
25	Harvard University Medical School			1	0			5	0			1	0													3	0					1	0	1	0	4	0			22	0	3	0	1	0	25
26	Tufts College Medical School							1	0			11	0					1	0											1	0					11	0			71	2					26
	MICHIGAN																																													
27	Detroit College of Medicine and Surgery																	0	1																									67	0	1	0	27
28	University of Michigan Medical School							3	0			2	0					1	0					1	0																	148	0	5	0	28
	MINNESOTA																																													
29	University of Minnesota Medical School			1	0			4	0									1	0							1	0	1	0															92	0	29
	MISSOURI																																													
30	St. Louis University School of Medicine	1	0					10	0															3	0	2	0	1	0	1	0									0	1			1	0	30
31	Washington University School of Medicine							0	1	1	0													2	1	1	0	1	0	1	0	1	0	1	0			1	0					1	0	31
	NEBRASKA																																													
32	Creighton University School of Medicine							19	1																	2	0	6	0																	32
33	University of Nebraska College of Medicine							2	0															2	0					2	0			1	0											33
	NEW YORK																																													
34	Albany Medical College											1	0																											1	0					34
35	Columbia University College of Phys. & Surg.									1	0	1	0	1	0			2	0					1	0											1	0							10	5	35
36	Cornell University Medical College	1	0					1	0			1	0											1	0																					36
37	Long Island College of Medicine											3	0																											2	0					37
38	New York Homeo. Med. Coll. and Flower Hospital							1	0			1	0																																	38
39	Syracuse University College of Medicine							2	0									1	0																					1	0					39
40	University and Bellevue Hospital Medical College											2	0											1	0			1	0																	40
41	University of Buffalo School of Medicine																																											10	4	41
42	University of Rochester School of Medicine							2	0																									1	0	5	0									42
	OHIO																																													
43	Ohio State University College of Medicine																																													43
44	University of Cincinnati College of Medicine			1	0													1	0													1	0									3	0	44
45	Western Reserve University School of Medicine																	1	0																					1	0			1	0	45
	OKLAHOMA																																													
46	University of Oklahoma School of Medicine																																													46
	OREGON																																													
47	University of Oregon Medical School							6	1																																	1	0			47
	PENNSYLVANIA																																													
48	Hahnemann Medical College and Hospital of Phila.							1	0			3	0	3	0	1	0	2	0																			4	0	3	1	1	0	1	0	48
49	Jefferson Medical College of Philadelphia	1	0					4	0			4	0	4	0			4	0	1	0									1	0	1	0			1	0	3	0	5	0	2	0			49
50	Temple University School of Medicine											1	0	1	0									1	0																					50
51	University of Pennsylvania School of Medicine							4	0							1	0	2	0					1	0									2	0			1	0	4	0	4	0	6	0	51
52	University of Pittsburgh School of Medicine																																												3	0	52
53	Woman's Medical College of Pennsylvania											1	0																																	53
	SOUTH CAROLINA																																													
54	Medical College of the State of South Carolina																	1	0																					1	1			1	0	54
	TENNESSEE																																													
55	Meharry Medical College																			7	0									2	0			6	0			3	0	1	0					55
56	University of Tennessee College of Medicine	1	0					1	0									1	0											1	0			3	0	1	0			1	0					56
57	Vanderbilt University School of Medicine	3	0																																					2	0			1	0	57
	TEXAS																																													
58	Baylor University College of Medicine							1	0																									2	0									1	0	58
59	University of Texas School of Medicine																																	2	0											59
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																							

P = Passed; F = Failed.

Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Exam. in	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
2 0								0 1				1 0												2 0				39	38	1	2.6	8	1
		1 0								1 0			3 0				1 0						4 0				2 0	75	74	1	1.3	14	2
								1 0																				51	51	0	0.0	3	3
																												55	55	0	0.0	2	4
1 0						1 0		1 0															1 0			2 0		51	51	0	0.0	11	5
						1 0		11 1						2 0 1 0														29	28	1	3.4	10	6
					17 0			36 22			5 0			17 0 2 0								1 0						139	115	24	17.3	12	7
1 0								24 0			2 0			3 0												5 0		57	57	0	0.0	9	8
6 0					1 0			7 4 2 0			1 0			6 1		2 0		3 0				3 0		1 0				63	56	7	11.1	17	9
3 0	1 0							2 0 1 0														1 0		1 0				56	55	1	1.8	12	10
								2 0						1 0														36	35	1	2.8	5	11
					2 0			10 3			4 0			4 0			1 0							1 0		1 1		122	109	13	10.7	15	12
3 0									1 0	1 0	1 0			2 0					1 0	1 0			2 0	1 0	4 1		2 1	128	124	4	3.1	24	13
											1 0																	2	2	0	0.0	2	14
1 0 1 0					1 0			10 1			4 0 1 0			2 0			3 0						3 0					148	147	1	0.7	26	15
1 0 3 0 2 0								1 0		1 0				2 0			2 0	1 0					4 0					132	130	2	1.5	18	16
														1 0													2 0	112	112	0	0.0	8	17
		1 0										1 0		1 0													1 0	103	103	0	0.0	10	18
2 0																												56	56	0	0.0	5	19
2 0 1 0								9 3 3 0 1 0 3 0 1 0						3 0			1 0	2 0		1 0			1 0 3 0			1 0	101	97	4	4.0	20	20
7 0 1 0								4 0 3 0			1 0			2 0				2 0 3 0					1 0				104	104	0	0.0	14	21
								2 0 2 0			2 0			1 0					3 0									63	63	0	0.0	16	22
					4 0			15 1 4 0			2 0			4 0 2 0									6 0			3 0		96	95	1	1.0	13	23
						3 0 2 0		8 4							4 0													55	49	6	10.9	8	24
					1 0			8 0 1 0			1 0 1 0			4 1				1 0		1 0					1 0 1 0			63	62	1	1.6	20	25
					5 0			19 5			1 0			3 0 7 0				1 0		1 0			1 0					141	134	7	5.0	14	26
								0 1																				70	68	2	2.9	4	27
2 0 1 0					1 0			9 0			1 0			1 0 6 0			1 0		1 0							1 0		185	185	0	0.0	17	28
1 0											3 0			1 0			3 0											108	108	0	0.0	10	29
81 0					3 0			13 1			6 0		1 0	3 0			1 0	1 0 1 0							1 0		1 0	133	131	2	1.5	19	30
48 0								1 0 2 0 1 0				1 0		2 0			1 0				2 0		1 0				2 0	73	71	2	2.7	20	31
			15 0					1 0			1 0		3 1						3 0			2 0				1 0	55	53	2	3.6	10	32
	1 0	39 0						3 2		2 0	2 0		1 0									1 0		1 0			60	58	2	3.3	13	33
								21 4						1 0													28	24	4	14.3	4	34
1 0					5 0			59 4														1 0					78	74	4	5.1	11	35
					2 0			46 4			1 0				2 0												59	55	4	6.8	8	36
					2 0			88 2						2 0												1 0	100	98	2	2.0	6	37
								74 10			2 0																88	78	10	11.4	4	38
								33 4 1 0 1 0						2 0												1 0	46	42	4	8.7	8	39
		1 0			1 0			119 1						2 0										1 0			129	128	1	0.8	8	40
								65 2						6 0													74	72	2	2.7	3	41
								12 1			4 0			1 0													26	25	1	3.8	6	42
											76 0			1 0 1 0													78	78	0	0.0	3	43
											57 0																63	63	0	0.0	5	44
											57 0																60	60	0	0.0	4	45
								2 1				42 0															45	44	1	2.2	2	46
1 0													30 0										8 0				47	46	1	2.1	5	47
					11 0			5 0			1 0			42 2 8 0													89	86	3	3.4	14	48
2 0					7 0			6 0 1 0 0 1 0 4 0						81 0 3 0 3 0									2 0			1 0	151	151	0	0.0	23	49
					2 1			4 1 1 0			1 0			42 1 1 0								0 1					58	54	4	6.9	10	50
1 0					5 0			5 2 1 7 0			6 0			83 1			1 0	1 0 1 0			1 0 1 0 1 1				2 0	154	150	4	2.6	22	51
								2 0						58 0													63	63	0	0.0	3	52
					1 0			2 1						6 0													11	10	1	9.1	4	53
					1 0			0 1 3 0						3 0		39 0		1 0					1 0				53	51	2	3.8	10	54
								4 0		1 0				1 0		2 0		36	1 1 1			0 1				1 0	68	65	3	4.4	13	55
8 0								1 0				1 0				1 0		112	1								133	132	1	0.8	12	56
8 0											1 0			2 0				33	0								50	50	0	0.0	7	57
	1 0								1 0									1 0	65 1								73	72	1	1.4	7	58
																			69 0								71	71	0	0.0	2	59
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	NAME OF COLLEGE	1 Alabama P F	2 Arizona P F	3 Arkansas P F	4 California P F	5 Colorado P F	6 Connecticut P F	7 Delaware P F	8 Dist. Columbia P F	9 Florida P F	10 Georgia P F	11 Idaho P F	12 Illinois P F	13 Indiana P F	14 Iowa P F	15 Kansas P F	16 Kentucky P F	17 Louisiana P F	18 Maine P F	19 Maryland P F	20 Massachusetts P F	21 Michigan P F	22 Minnesota P F
	VERMONT																						
60	University of Vermont College of Medicine																		1 0		2 0		
	VIRGINIA																						
61	Medical College of Virginia								1 0	2 1			1 0							1 0		1 0	1
62	University of Virginia Department of Medicine								1 0	1 0								1 0		1 0			
	WISCONSIN																						
63	Marquette University School of Medicine												1 0			1 0						1 0	3
64	University of Wisconsin Medical School				2 0								1 0			2 0							1
	CANADA																						
65	Dalhousie University Faculty of Medicine																						
66	Laval University Faculty of Medicine				0 1														1 0		2 2		
67	McGill University Faculty of Medicine				7 0			1 0							1 0			2 0	2 0	1 0	1 1	1 0	
68	Queen's University Faculty of Medicine				1 0		2 0														1 0	1 0	1
69	University of Alberta Faculty of Medicine																					1 0	2
70	University of Manitoba Faculty of Medicine				2 0																1 0		1
71	University of Montreal Faculty of Medicine																		1 0		1 2		
72	University of Toronto Faculty of Medicine	1 0			2 0		2 0						1 0					1 0		1 0	1 0	3 0	1
73	University of Western Ontario Medical School												1 0									12 0	
74	Foreign Medical Colleges				12 5	1 0	2 0				1 0	1 0	7 3		3 1			2 0		3 1	3 1		
75	Miscellaneous Medical Colleges	0 1	1 0	0 2	1 0						6 1	1 0	0 1		2 0			2 1				2 0	
76	Undergraduates, Osteopaths and Graduates of Nondescript and Class C Colleges			1 0	58 4	10 2	2 2	2			0 1		32 8		1 0						44	90	
77	Totals by states	29	21	29	391	50	70	12	27	60	77	5	389	124	110	74	65	103	30	156	317	260	13
78	Totals—Examined—Passed	29	20	29	373	48	66	12	27	55	77	5	364	124	109	74	64	102	30	153	214	260	12
79	Totals—Examined—Failed	0	1	0	18	2	4	0	0	5	0	0	25	0	1	0	1	1	0	3	103	0	
80	Percentage of Failures	0.0	4.8	0.0	4.6	4.0	5.7	0.0	0.0	8.3	0.0	0.0	6.4	0.0	0.9	0.0	1.5	1.0	0.0	1.9	32.5	0.0	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	

P = Passed; F = Failed.

(CONTINUED FROM PAGE 1457)

The number of Canadian applicants decreased in 1931 over the preceding year (162 as compared with 210) as well as the number of foreign applicants (158 as compared with 167). The requirement of citizenship by some states before a license can be issued may be one of the factors responsible for this decrease.

UNDERGRADUATES, GRADUATES OF NONDESCRIPT COLLEGES AND OSTEOPATHS

For the last ten years, the few undergraduates examined have been accidental or exceptional instances. In 1931, only one was examined, and he failed. This candidate was admitted to the examination as a graduate of a medical school in the Philippine Islands, but an investigation at present in process indicates the diploma presented probably was fraudulent. For statistical purposes he was listed as an undergraduate.

Boards in seven states, however, registered by examination 100 graduates of osteopathic colleges as physicians and surgeons, or granted them licenses to practice osteopathy and surgery or osteopathy and medicine.

Sixty graduates of institutions rated in class C or unrecognized medical schools were also licensed by examination during the year.

Further details regarding these licentiates, as well as such candidates registered by reciprocity or endorsement, are given elsewhere in this report.

PHYSICIANS REGISTERED BY RECIPROCITY AND ENDORSEMENT

Table 3 shows that 2,165 physicians were registered by various states and territories in 1931 on the presentation of satisfactory credentials. The physicians so accepted presented licenses from other states, Canada, foreign countries, the certificate of the National Board of Medical Examiners or one of the government services. In an increasing number of states the boards

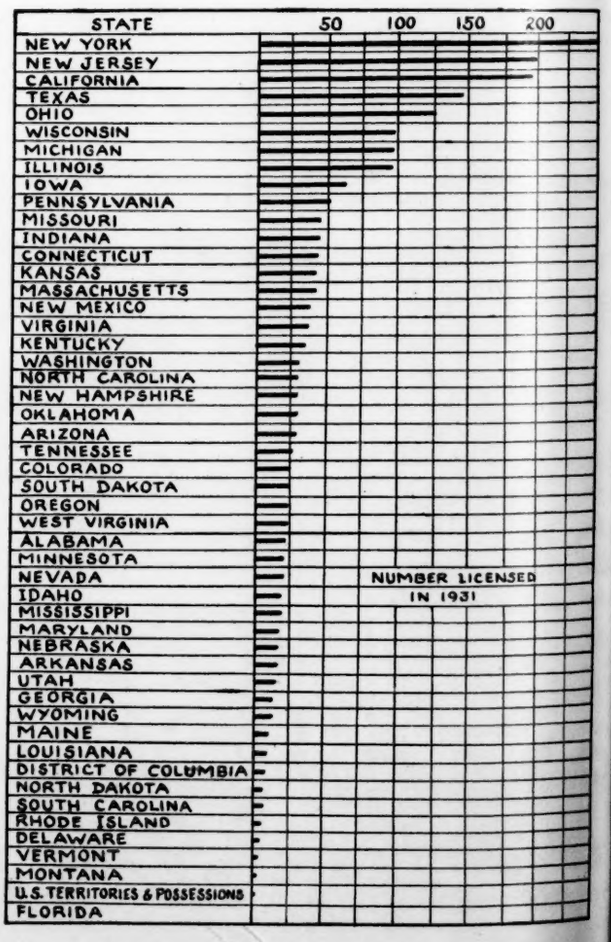

Chart 1.—Licenses granted by reciprocity and endorsement — 1931.

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Territories and Possessions	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Exam. in	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
								2 1						1 0	2 0						16 0						1 0	26	25	1	3.8	7	60
1 0						3 0		1 118	0		1 0			2 0				1 0			58 0		10 0			1 0	105	103	2	1.9	16	61
								3 0	1 0					1 0				2 0			37 0	2 0	4 0				54	54	0	0.0	11	62
								1 0	0	1 3	0													60	6		77	70	7	9.1	8	63
3 0								3 0				1 0												27	3		43	40	3	7.0	8	64
								2 0			1 0																3	3	0	0.0	2	65
								1 0			0 1			1 0				1 0									10	6	4	40.0	7	66
					1 0	2 0		16 4						3 0					1 0	1 0							45	40	5	11.1	14	67
					1 0			7 5			1 0			1 0											1 0		22	17	5	22.7	10	68
								3 0			0 1																7	6	1	14.3	4	69
										3 0				1 0										1 0			9	9	0	0.0	6	70
					1 0	1																					7	4	3	75.0	4	71
						2 0		20 1			3 1	1 0			1 0								1 0				43	41	2	4.7	15	72
								2 0						1 0													16	16	0	0.0	4	73
				2 0		6 3		36 47			1 4			5 0				0 1	2 0	1 0					0 1	3 0	158	91	67	42.4	20	74
1 0						1 0					1 0			1 0 1 0		1 0									1 0 2 0		30	24	6	20.0	18	75
																			5 0				2 0 0	1 2 0			265	157	108	40.8	12	76
35	157	7	57	2	6	96	0	984	74	17	266	51	41	425	36	47	16	201	156	9	20	103	33	38	109	5	36	5576	....	....	.....	...	77
35	157	7	57	2	6	91	0	838	74	16	259	51	40	419	36	47	16	198	154	9	20	101	33	36	98	5	34	....	5224	....	.....	...	78
0	0	0	0	0	0	5	0	146	0	1	7	0	1	6	0	0	0	3	2	0	0	2	0	2	11	0	2	....	....	352	.....	...	79
0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	14.8	0.0	5.9	2.6	0.0	2.4	1.4	0.0	0.0	0.0	1.5	1.3	0.0	0.0	1.9	0.0	5.3	10.1	0.0	5.6	....	....	....	6.3	...	80
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

now accept a physician's credentials, if satisfactory, whether or not the state board issuing the original license returns the favor. The following twenty-seven states and the District of Columbia generally will register without examination licentiates of any state who present satisfactory evidence of good moral character and practice record, and in addition thereto credentials which correspond to those required by their respective states at the time such licenses were issued:

Arizona	Michigan	Ohio
California	Minnesota	Oklahoma
Colorado	Missouri	Oregon
Connecticut	Nebraska	Pennsylvania
Delaware	Nevada	South Dakota
District of Columbia	New Hampshire	Texas
Georgia	New Jersey	Utah
Idaho	New Mexico	Vermont
Illinois	North Carolina	Wisconsin
Maine		

California (at the discretion of the board), Illinois and Minnesota require a practical or oral examination of reciprocity candidates, before a license is granted by this means.

Reciprocity applicants in Connecticut, District of Columbia, Minnesota, Nebraska and Wisconsin must comply with requirements of the board of examiners in the basic sciences before being eligible for medical licensure.

New York granted the greatest number of licenses in 1931 (252), New Jersey was second with 199, California third with 193, and Texas fourth with 144. The largest group presenting the same type of credentials were the 278 diplomates of the National Board of Medical Examiners; the next greatest number came from Illinois (178), and New York was third (156).

Chart 1 illustrates the totals recorded in table 3. It will be noted that New York, New Jersey, California and Texas licensed a far greater number of candidates by reciprocity and endorsement than did the other states. Florida, at the bottom of the list, has no reciprocal relations with other states or boards. Massachusetts and Rhode Island accept only the certificate of the National Board of Medical Examiners. Rhode Island requires such candidates to pass an oral examination.

COMPARISON WITH OTHER YEARS

In table 4 are listed the total number of candidates registered in the various states in the past five years, with the numbers examined (passed and failed), those licensed by reciprocity and endorsement, and special exemption. In the past five years, New York has registered 5,450 candidates, California, 3,046, Illinois, 2,404 and Pennsylvania 2,228. The percentage of candidates who failed in the examinations in the last five years and the percentage of the total licensed by reciprocity and endorsement are given in the last two columns. The proportion of failures in all the states has dropped from 7.1 per cent in 1927 to 6.3 per cent in 1931, and the number of physicians licensed by reciprocity and endorsement has decreased from 29.9 to 28.5 per cent. It may be worthy of note that, in the five year period, 50 per cent of the candidates failed the examination in New Mexico, 28.7 per cent in Massachusetts and 24 per cent in Nevada. On the other hand, in the five year period, Georgia, Kansas, Minnesota, New Hampshire, Oklahoma and South Dakota reported no failures. A comparison of this table with the statistics in the last Educational Number of THE JOURNAL (Aug. 29, 1931, p. 622, table 3) shows that the states having the largest numbers of medical graduates naturally had the largest number of candidates examined. Altogether, 27,828 were examined by state boards in five years, of whom 26,038 (93.6 per cent) were registered—an average of 5,207 each year.

A study of totals and percentages (table 5) for each year beginning with 1904 is of interest. The number (5,576) examined in 1931 was 56 more than the num-

TABLE 3.—*Physicians Registered by Reciprocity and Endorsement—1931*

Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
State	Total Registered in Each State	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Government Services	Nat. Bd. Med. Ex.	U.S. Terr. & Poss.	Canada and Foreign
Alabama	21	..	..	..	..	..	..	..	..	..	5	..	2	..	..	..	1	3	..	..	..	..	..	3	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..
Arizona	28	..	..	1	2	..	..	..	..	..	..	1	3	..	1	..	1	..	..	..	1	1	..	1	3	1	..	..	..	..	..	4	..	..	1	1	..	1	..	..	..	2	..	..	..	..	..	1	..	..	..	2	..	..
Arkansas	16	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..
California	193	..	1	1	..	5	..	..	2	..	2	2	25	4	11	5	1	1	..	2	1	5	17	1	6	2	10	..	..	..	..	10	2	..	11	5	6	5	..	..	2	2	8	6	..	1	6	..	3	..	10	10	2	..
Colorado	25	..	..	1	3	..	..	..	..	..	..	..	3	4	1	2	..	2	..	..	..	3	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..
Connecticut	42	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	1	..	2	1	2	..	1	..	1	..	1	..	..	..	..	12	1	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	13	..	..
Delaware	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
District of Columbia	9	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	14	..	..	1	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	2	..	..	1	..	..	1	..	..	..	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..
Idaho	18	..	..	1	3	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	1	..	4	..	..	2	..	1	..	..	..	..	..
Illinois	96	1	..	1	..	2	..	..	..	..	..	..	..	..	5	4	3	2	..	1	..	3	8	2	17	..	1	..	..	..	..	..	..	..	3	..	1	4	..	..	..	6	1	1	..	..	..	1	7	..	5	17	..	..
Indiana	43	1	..	..	..	..	..	..	..	..	..	..	11	..	1	..	5	..	..	3	..	9	1	..	..	..	..	..	..	..	..	1	1	..	5	..	..	2	..	..	..	1	..	..	..	..	..	1	1	..	..	..	..
Iowa	66	1	..	..	..	..	..	..	..	..	1	..	17	..	..	7	..	2	1	..	..	1	..	..	7	..	14	..	..	..	1	..	..	..	2	1	..	2	..	..	..	..	..	..	..	2	..	..	2	..	..	5	..	..
Kansas	41	..	..	1	..	..	..	..	..	..	..	..	6	1	1	..	1	..	..	..	..	3	..	..	7	..	9	..	..	..	..	..	..	..	3	1	..	..	..	..	..	1	2	..	..	1	1	..	1	..	..	2	..	..
Kentucky	34	..	..	2	3	..	..	..	..	..	..	..	3	3	..	..	..	2	..	1	..	1	..	1	2	..	..	..	..	..	..	..	1	..	7	..	..	..	..	..	..	4	1	..	..	2	..	..	..	..	..	1	..	..
Louisiana	10	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..
Maine	11	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	1	..	..	..	1	..	..	3	..	..
Maryland	17	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	..	1	..	..	2	..	..	..	4	..	..	..	..	..	..	..	..	..	5	..	..
Massachusetts	41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41	..	..
Michigan	97	..	..	4	1	..	..	1	..	1	..	..	22	5	11	5	1	1	..	3	2	..	2	..	4	..	4	..	..	..	..	2	..	..	6	1	1	4	..	2	..	7	2	..	..	1	..	1	3	..	..	..	..
Minnesota	20	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	1	3	..	6	..	..
Mississippi	18	1	..	1	..	..	..	..	..	..	2	..	1	..	..	..	1	3	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	1	..	..	..	..	1	..	..	..	..	..
Missouri	44	..	..	3	1	1	..	..	..	..	1	..	5	..	..	11	2	..	..	1	..	1	3	..	1	..	..	..	..	..	1	..	1	..	..	..	1	2	..	..	..	3	1	..	..	..	..	..	..	..	4	..	..
Montana	3	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nebraska	17	..	..	1	..	1	..	..	..	..	..	..	..	4	1	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..
Nevada	20	..	..	..	3	..	..	..	..	1	..	..	1	..	..	..	1	1	..	..	..	1	..	2	..	1	2	..	..	..	..	..	..	..	..	..	..	1	..	2	..	1	..	..	..	..	1	..	..	..	2	..	..
New Hampshire	29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	11	..	1	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	6	..	..
New Jersey	199	1	..	..	1	3	..	2	2	3	..	..	3	2	2	1	..	2	1	6	3	6	2	..	2	..	3	..	..	..	..	97	6	..	1	..	..	21	2	1	..	2	2	..	4	3	..	1	..	..	14	..	..
New Mexico	37	1	1	..	..	2	1	..	..	..	1	..	3	..	1	1	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	3	..	..	2	..	..	..	..	..	..	..	15	..	..	..	2	..	..	..	..	1	..	..
New York	252	1	..	..	4	..	5	..	1	1	4	1	4	5	6	..	1	1	1	21	10	3	8	..	1	..	..	..	..	16	..	..	5	..	17	..	1	11	..	..	..	13	4	..	..	13	..	2	1	1	..	73	7	10
North Carolina	30	..	..	1	..	..	..	..	1	..	3	..	3	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	1	4	..	..	..	3	..	..	..	..	..	..	..	..	6	..	2
North Dakota	7	..	..	..	..	..	..	..	..	..	..	..	2	1	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Ohio	125	..	1	1	2	3	..	..	..	..	2	..	7	6	3	9	9	..	1	6	..	26	..	1	5	..	..	..	..	..	..	8	2	..	..	..	1	12	..	1	..	6	3	..	..	1	..	3	..	..	..	6	..	..
Oklahoma	29	..	..	4	..	..	..	..	..	..	..	..	2	..	3	1	2	..	..	1	..	2	..	..	2	..	1	..	..	..	..	..	..	1	1	..	..	..	..	1	..	5	3	..	..	..	..	..	..	..	..	..	..	..
Oregon	24	..	..	..	1	1	..	..	..	..	1	..	1	2	1	2	..	..	..	..	..	..	1	..	..	2	1	1	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	1	..	..	2	..	..	..	..	5	..	..
Pennsylvania	51	..	..	..	1	1	..	2	..	1	..	..	4	..	1	..	..	..	1	1	2	3	4	..	..	..	1	..	..	4	..	1	4	..	2	..	..	..	..	..	..	..	..	1	..	..	2	..	1	..	..	14	..	..
Rhode Island	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..
South Carolina	7	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..
South Dakota	25	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	2	12	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	2	..	..
Tennessee	26	1	..	2	..	..	..	..	..	..	..	..	3	1	2	..	3	1	..	2	..	..	1	1	2	..	..	..	..	..	..	..	1	..	1	..	..	1	..	1	..	..	..	..	..	1	..	..	2	..	..	..	..
Texas	144	1	..	11	1	1	1	..	2	1	4	1	6	4	6	1	3	24	..	2	2	4	2	3	10	..	3	..	..	..	..	4	1	..	4	14	..	5	..	..	..	14	..	..	..	1	..	..	2	..	..	..	..
Utah	16	..	..	..	1	..	..	..	..	..	..	1	1	..	3	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	5	..	..
Vermont	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..
Virginia	36	2	..	..	..	..	..	..	3	..	3	..	..	..	..	..	1	..	..	6	..	..	..	1	..	..	..	..	..	..	..	1	4	..	..	..	..	2	..	1	..	5	..	..	..	..	..	1	..	1	5	..	..
Washington	31	..	..	..	2	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	5	..	1	1	1	..	..	..	..	..	..	1	..	1	4	3	..	..	..	..	2	..	..	..	..	1	1	..	..	5	..	..
West Virginia	24	..	..	..	1	..	..	..	..	..	..	..	3	1	..	..	..	1	..	3	..	1	..	..	..	..	..	..	..	..	..	..	2	..	2	..	1	..	1	..	..	..	..	..	4	3	..	..	..	..	1	..	..
Wisconsin	98	..	..	..	1	..	..	..	..	..	..	..	31	4	8	1	..	1	..	..	..	10	16	..	5	..	2	..	..	..	..	2	..	1	3	1	1	..	..	..	1	2	..	1	..	2	..	..	..	1	4	..	..
Wyoming	14	..	..	..	1	..	..	..	..	..	1	1	1	..	1	1	..	1	..	..	..	1	2	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..
U. S. Territories and Possessions	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Totals	2,165	11	3	33	39	22	10	2	13	7	36	7	178	45	80	54	39	55	12	67	36	96	86	17	83	9	62	1	2	21	1	156	35	4	80	28	18	89	3	13	4	90	53	18	12	44	21	21	29	2	19	278	9	12
Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53

This table shows the number of physicians registered in each state by the acceptance of other state licenses or credentials. Read from left to right, it shows the total number of physicians registered in the state named and the number of candidates coming from each of the states, the United States government services, National Board of Medical Examiners, United States territories and possessions, Canada and foreign countries. Read from above downward, the figures show the number of physicians who left the state named at the top of the column and went to each of the states named at the left in the corresponding lines. At the bottom is given the total number of candidates transferring to other states and also where the physicians registered through reciprocity and endorsement obtained their original licenses or credentials.

ber examined in 1930 but 410 less than in 1925. By all methods—examination, reciprocity and endorsement, and exemption—7,443 candidates were licensed in 1931, 121 less than in 1930. It will be seen that there is no constant increase or decrease in the total number of candidates registered from 1904 to 1931. There has been considerable fluctuation in the number between these years but no constant rise or fall. This is illustrated in chart 2. The sharp fall in the number of physicians registered in 1918 was, of course, due to the sudden withdrawal of physicians and recent graduates from civilian life. Again in 1922 there was a noticeable decline, this figure representing the small class that began the study of medicine in 1918. The curve representing those licensed by examination follows quite closely the total registration curve. The curve representing those licensed by reciprocity and endorsement shows an irregular but none the less constant increase from 394 in 1905 to 2,219 in 1931.

QUALIFICATIONS OF LICENTIATES

Table 6, giving the qualifications of physicians licensed in 1931, shows that today an overwhelming majority of licentiates are graduates of approved [2] medical schools. There were 6,796 graduates of these schools licensed in 1931, as compared with 130 from

TABLE 4.—*Total Registration—Examination, Reciprocity and Endorsement—1927-1931*

	1927			1928			1929			1930			1931			Totals for 5 Yrs.				
	Examined		Reciprocity, Endorsement of Credentials and Special Exemption	Examined		Reciprocity, Endorsement of Credentials and Special Exemption	Examined		Reciprocity, Endorsement of Credentials and Special Exemption	Examined		Reciprocity, Endorsement of Credentials and Special Exemption	Examined		Reciprocity, Endorsement of Credentials and Special Exemption	Examined	Reciprocity, Endorsement of Credentials and Special Exemption	Registered	Percentage Failed in Examination	Percentage Licensed by Reciprocity, Endorsement of Credentials and Special Exemption
	Passed	Failed		Passed	Failed		Passed	Failed		Passed	Failed		Passed	Failed						
Alabama	35	0	11	25	0	40	34	1	30	27	1	37	29	0	21	152	139	289	1.3	48.1
Arizona	10	3	24	13	2	36	11	1	46	19	0	36	20	1	28	80	170	243	8.7	70.0
Arkansas	48	1	9	42	0	18	81	0	26	25	0	21	29	0	16	226	90	315	0.4	28.6
California	320	21	328	371	20	225	393	40	268	329	31	243	373	18	196	1,916	1,260	3,046	6.8	41.4
Colorado	77	34	55	66	15	40	50	0	40	55	0	40	48	2	25	347	200	496	14.7	40.3
Connecticut	57	2	34	67	5	35	68	3	36	51	10	39	66	4	44	333	188	497	7.2	37.8
Delaware	2	0	7	10	0	10	11	0	7	7	1	11	12	0	5	43	40	82	2.3	48.8
District of Columbia	99	0	14	104	0	18	51	1	13	34	0	24	27	0	9	316	78	393	0.3	19.8
Florida	90	10	0	72	3	0	72	3	0	71	8	0	55	5	1	389	1	361	7.5	0.3
Georgia	67	0	22	91	0	19	78	0	11	72	0	12	77	0	14	385	78	463	0.0	16.8
Idaho	17	2	14	5	1	11	5	2	15	7	0	9	5	0	18	44	67	106	11.4	63.2
Illinois	379	38	107	345	30	112	381	22	113	388	38	119	364	25	96	2,010	547	2,404	7.6	22.8
Indiana	103	2	59	103	0	42	116	0	42	116	0	37	124	0	43	564	223	785	0.4	29.7
Iowa	91	0	33	110	1	34	100	0	35	112	0	45	109	1	66	524	213	735	0.4	29.0
Kansas	56	0	25	53	0	26	81	0	32	75	0	34	74	0	41	339	158	497	0.0	31.8
Kentucky	72	1	37	76	0	46	65	0	51	76	3	33	64	1	34	358	201	554	1.4	36.3
Louisiana	99	2	15	107	1	13	97	0	9	99	1	10	102	1	10	509	57	561	1.0	10.2
Maine	25	5	10	29	1	12	24	2	13	22	1	15	30	0	11	139	61	191	6.5	31.9
Maryland	96	5	28	116	4	31	106	0	26	120	1	27	153	3	17	604	129	720	2.2	17.9
Massachusetts	195	75	27	221	91	31	211	84	41	230	78	44	214	103	41	1,502	184	1,255	28.7	14.7
Michigan	217	1	79	253	2	91	266	1	101	302	0	92	260	0	97	1,302	460	1,758	0.3	26.2
Minnesota	137	0	46	156	0	47	155	0	39	176	0	26	150	0	20	774	178	952	0.0	18.7
Mississippi	21	0	20	24	0	29	27	0	23	31	2	21	35	0	18	140	111	249	1.4	44.6
Missouri	124	1	39	105	1	74	116	1	79	149	0	72	157	0	44	654	308	959	0.5	32.1
Montana	9	1	13	12	1	14	9	0	9	13	0	15	7	0	3	52	54	104	3.8	51.9
Nebraska	96	5	11	69	2	8	67	0	9	65	0	7	57	0	17	361	52	406	1.9	12.8
Nevada	7	1	17	6	3	10	2	2	15	2	0	15	2	0	20	25	77	96	24.0	80.2
New Hampshire	5	0	22	1	0	17	2	0	18	1	0	27	6	0	29	15	113	128	0.0	88.3
New Jersey	57	6	177	60	5	181	70	2	220	82	3	185	91	5	199	381	962	1,322	5.5	72.8
New Mexico	0	0	24	0	1	18	1	0	23	0	0	31	0	0	37	2	133	134	50.0	99.3
New York	897	111	176	835	123	226	900	143	232	809	108	250	838	146	267	4,910	1,171	5,450	12.9	21.5
North Carolina	91	0	38	69	4	32	97	8	45	85	5	29	74	0	30	433	174	590	3.9	29.5
North Dakota	16	2	3	14	1	10	17	5	3	16	2	6	16	1	7	80	29	108	12.2	26.9
Ohio	243	3	110	288	8	111	272	1	121	231	1	113	259	7	125	1,313	580	1,873	1.5	31.0
Oklahoma	50	0	54	54	0	39	54	0	45	52	0	45	51	0	29	261	212	473	0.0	44.8
Oregon	41	4	25	34	4	32	31	4	38	32	1	32	40	1	24	192	151	329	7.3	45.9
Pennsylvania	363	10	63	376	5	51	399	4	43	421	9	42	419	6	51	2,012	250	2,228	1.7	11.2
Rhode Island	28	3	0	25	3	3	50	0	2	72	2	7	36	0	7	219	19	230	3.7	8.3
South Carolina	37	1	12	46	0	12	29	0	9	37	0	5	47	0	7	197	45	241	0.5	18.7
South Dakota	10	0	9	12	0	11	11	0	15	17	0	13	16	0	25	66	73	139	0.0	52.5
Tennessee	133	0	18	129	0	22	153	0	19	155	0	19	198	3	26	771	104	872	0.4	11.9
Texas	133	2	151	141	5	171	148	0	206	147	0	246	154	2	171	732	945	1,668	1.2	56.7
Utah	5	1	9	4	0	10	8	0	18	10	0	7	9	0	16	37	60	96	2.7	62.5
Vermont	22	0	8	31	0	4	31	1	11	19	0	8	20	0	5	124	36	159	0.8	22.6
Virginia	103	1	30	105	0	30	120	3	33	122	5	28	101	2	36	562	157	708	2.0	22.2
Washington	27	2	46	35	1	66	46	1	47	47	2	45	33	0	31	194	235	423	3.1	55.6
West Virginia	59	2	43	40	1	26	43	3	31	41	0	26	36	2	24	227	150	369	3.5	40.7
Wisconsin	38	1	48	72	1	61	79	6	62	98	0	94	98	11	98	404	363	748	4.7	48.5
Wyoming	2	0	17	1	0	11	0	1	15	4	0	9	5	0	18	13	70	82	7.7	85.4
U. S. Territories and Possessions	169	28	0	149	23	6	123	21	3	32	4	10	34	2	2	585	21	528	13.3	4.0
Totals	5,078	387		5,172	368		5,361	366		5,203	317		5,224	352						
Examined	5,465			5,540			5,727			5,520			5,576			27,828				
Reciprocity, Endorsement of Credentials and Special Exemption			2,167			2,222			2,408			2,361			2,219		11,377			
Registered	7,245			7,394			7,769			7,564			7,443					37,415		
Percentage failed in examination	7.1			6.6			6.4			5.7			6.3						6.4	
Percentage licensed by Reciprocity, Endorsement of Credentials and Special Exemption	29.9			30.1			31.0			31.2			28.5							30.4

licenses or credentials. Read from left to right, it shows the total number of physicians registered in each state by the acceptance of other state licenses or credentials. Read from above downward, the figures show the number of physicians registered in the state named and the number of candidates coming from each of the states, the United States government services, National Board of Medical Examiners, United States territories and possessions, Canada and foreign countries. Read from above downward, the figures show the number of physicians who left the state named at the top of the column and went to each of the states named at the left in the corresponding lines. At the bottom is given the total number of candidates transferring to other states and also where the physicians registered through reciprocity and endorsement obtained their original licenses or credentials.

2. Since 1928, the Council on Medical Education and Hospitals of the American Medical Association has dropped the designation class A, B or C, as applied to medical colleges. At a business meeting in June, 1931, the Council passed a resolution that in its reports and ratings of medical colleges, however, the terms class A and approved shall be synonymous and may be used interchangeably.

TABLE 5.—*Registration by State Boards—1904-1931*

Year	All Candidates Examined				Registered Without Written Examination	Total Registered
	Examined	Passed	Failed	Percentage Failed		
1904	7,038	5,675	1,363	19.4	999	6,674
1905	7,173	5,683	1,490	20.8	394	6,077
1906	8,035	6,368	1,667	20.7	1,499	7,867
1907	7,274	5,726	1,548	21.3	1,427	7,153
1908	7,771	6,085	1,686	21.7	1,280	7,365
1909	7,290	5,860	1,430	19.6	1,372	7,232
1910	7,004	5,712	1,292	18.4	1,640	7,352
1911	6,932	5,580	1,382	19.8	1,243	6,823
1912	6,880	5,467	1,413	20.5	1,270	6,737
1913	6,447	5,248	1,199	18.6	1,291	6,539
1914	5,572	4,372	1,200	21.5	1,437	5,809
1915	5,317	4,490	827	15.6	1,393	5,883
1916	4,854	4,127	727	15.0	1,349	5,476
1917	4,739	4,070	669	14.1	1,359	5,429
1918	3,643	3,160	483	13.3	1,045	4,205
1919	4,749	4,073	676	14.2	2,541	6,614
1920	4,793	4,059	734	15.3	2,551	6,610
1921	4,813	4,217	596	12.4	2,171	6,388
1922	4,008	3,516	492	12.3	2,054	5,570
1923	4,706	4,007	699	14.9	2,370	6,377
1924	5,373	4,737	636	11.8	1,887	6,624
1925	5,986	5,434	552	9.2	1,835	7,269
1926	5,815	5,348	467	8.0	1,925	7,273
1927	5,465	5,078	387	7.1	2,167	7,245
1928	5,540	5,172	368	6.6	2,222	7,394
1929	5,727	5,361	366	6.4	2,408	7,769
1930	5,520	5,203	317	5.7	2,361	7,564
1931	5,576	5,224	352	6.3	2,219	7,443

those schools formerly classified as class B, 216 from nondescript schools,[3] and 301 from the miscellaneous colleges.[4] Among the graduates of nondescript schools were 134 osteopaths, including 100 licensed by examination as physicians and surgeons—in California, 58 (by the Board of Osteopathic Examiners); Colorado, 10; Connecticut, 2 (1 in medicine only); Massachusetts, 21; Texas, 5; Washington, 2 (surgery); Wisconsin, 2 (surgery); and by reciprocity and endorsement 34, including California, 3 (by the Board of Osteopathic Examiners); Rhode Island, 1 (surgery, listed in table 1 under special exemption); Texas, 27 and Wyoming, 4 (surgery).

Included among the nondescript were 60 graduates of class C or unrecognized medical schools licensed by examination in Arkansas, 1; Illinois, 33; Iowa, 1; Massachusetts, 23; Pennsylvania, 1, and Tennessee, 1. Twenty-one by reciprocity and endorsement, in Califor-

3. Graduates of medical schools formerly rated in class C, institutions not recognized as medical schools by the American Medical Association and osteopaths licensed to practice medicine or surgery or both.

4. Those who graduated prior to 1907—before the first classification of medical colleges was completed—and graduates of foreign colleges are included under "miscellaneous," with one exception, that graduates prior to 1907 of medical colleges which since that date have been rated as class A or approved are listed in these statistics under class A.

TABLE 6.—*Qualifications of Physicians Licensed—1931*

	By Examination					By Reciprocity, Endorsement of Credentials or Special Exemption					Totals Registered from Medical Colleges in Class				
	Medical Colleges in Class					Medical Colleges in Class									
	A	B	Nondescript	Miscellaneous	Totals	A	B	Nondescript	Miscellaneous	Totals	A	B	Nondescript	Miscellaneous	Grand Totals
Alabama	29	0	0	0	29	20	1	0	0	21	49	1	0	0	50
Arizona	20	0	0	0	20	19	3	0	6	28	39	3	0	6	48
Arkansas	27	0	1	1	29	15	1	0	0	16	42	1	1	1	45
California	302	1	58	12	373	164	12	5	15	196	466	13	63	27	569
Colorado	36	0	10	2	48	20	5	0	0	25	56	5	10	2	73
Connecticut	59	2	2	3	66	38	2	0	4	44	97	4	2	7	110
Delaware	12	0	0	0	12	4	0	0	1	5	16	0	0	1	17
District of Columbia	27	0	0	0	27	4	0	3	2	9	31	0	3	2	36
Florida	47	3	0	5	55	0	0	0	1	1	47	3	0	6	56
Georgia	75	0	0	2	77	12	0	0	2	14	87	0	0	4	91
Idaho	5	0	0	0	5	17	1	0	0	18	22	1	0	0	23
Illinois	323	1	33	7	364	89	2	0	5	96	412	3	33	12	460
Indiana	124	0	0	0	124	36	4	0	3	43	160	4	0	3	167
Iowa	103	1	1	4	109	55	4	1	6	66	158	5	2	10	175
Kansas	74	0	0	0	74	33	3	0	5	41	107	3	0	5	115
Kentucky	64	0	0	0	64	30	2	1	1	34	94	2	1	1	98
Louisiana	95	5	0	2	102	10	0	0	0	10	105	5	0	2	112
Maine	28	1	0	1	30	9	0	0	2	11	37	1	0	3	41
Maryland	150	0	0	3	153	15	0	1	1	17	165	0	1	4	170
Massachusetts	164	2	44	4	214	41	0	0	0	41	205	2	44	4	255
Michigan	258	1	0	1	260	91	1	0	5	97	349	2	0	6	357
Minnesota	150	0	0	0	150	20	0	0	0	20	170	0	0	0	170
Mississippi	35	0	0	0	35	15	0	0	3	18	50	0	0	3	53
Missouri	156	0	0	1	157	39	2	0	3	44	195	2	0	4	201
Montana	7	0	0	0	7	3	0	0	0	3	10	0	0	0	10
Nebraska	57	0	0	0	57	16	0	0	1	17	73	0	0	1	74
Nevada	0	0	0	2	2	11	4	1	4	20	11	4	1	6	22
New Hampshire	5	1	0	0	6	28	1	0	0	29	33	2	0	0	35
New Jersey	84	0	0	7	91	175	4	2	18	199	259	4	2	25	290
New Mexico	0	0	0	0	0	23	4	2	8	37	23	4	2	8	37
New York	799	3	0	36	838	218	7	1	41	267	1,017	10	1	77	1,105
North Carolina	74	0	0	0	74	23	2	1	4	30	97	2	1	4	104
North Dakota	15	1	0	0	16	6	0	0	1	7	21	1	0	1	23
Ohio	256	1	0	2	259	112	3	0	10	125	368	4	0	12	384
Oklahoma	51	0	0	0	51	24	3	0	2	29	75	3	0	2	80
Oregon	40	0	0	0	40	21	1	0	2	24	61	1	0	2	64
Pennsylvania	409	3	1	6	419	51	0	0	0	51	460	3	1	6	470
Rhode Island	34	0	0	2	36	6	0	1	0	7	40	0	1	2	43
South Carolina	47	0	0	0	47	6	0	0	1	7	53	0	0	1	54
South Dakota	15	0	0	1	16	25	0	0	0	25	40	0	0	1	41
Tennessee	197	0	1	0	198	23	1	0	2	26	220	1	1	2	224
Texas	147	0	5	2	154	103	17	31	20	171	250	17	36	22	325
Utah	8	0	0	1	9	16	0	0	0	16	24	0	0	1	25
Vermont	20	0	0	0	20	4	0	0	1	5	24	0	0	1	25
Virginia	101	0	0	0	101	34	1	0	1	36	135	1	0	1	137
Washington	31	0	2	0	33	26	4	0	1	31	57	4	2	1	64
West Virginia	36	0	0	0	36	21	1	0	2	24	57	1	0	2	60
Wisconsin	94	2	2	0	98	90	5	1	2	98	184	7	3	2	196
Wyoming	3	0	0	2	5	11	1	4	2	18	14	1	4	4	23
U. S. Territories and Possessions	31	0	0	3	34	0	0	1	1	2	31	0	1	4	36
Totals	4,924	28	160	112	5,224	1,872	102	56	189	2,219	6,796	130	216	301	7,443

The following states have separate homeopathic examining boards: Arkansas, Connecticut, Delaware, Louisiana and Maryland. In 1931, Connecticut licensed four by examination and one by special exemption; Delaware, three, and Maryland, four by examination. None were licensed in Arkansas and Louisiana. The one eclectic board in existence, Arkansas, licensed one by examination.

nia, 2; District of Columbia, 3; Iowa, 1; Kentucky, 1; Maryland, 1; Nevada, 1; New Jersey, 2; New Mexico, 2; New York, 1; North Carolina, 1; Texas, 4; Wisconsin, 1, and Alaska, 1.

The states that accepted graduates of class B, C or unrecognized schools either have their own list of approved medical colleges or granted licenses after careful consideration of the applicant's credentials.

The educational fitness of the persons licensed to practice the healing art in the past fifteen years is shown in table 7. Of the 7,443 candidates registered by all methods in 1931, 6,796, or 91.3 per cent, graduated from approved schools; 130, or 1.7 per cent, from class B schools; 216, or 2.9 per cent, from nondescript schools, and 301, or 4.0 per cent, from miscellaneous schools. By comparing these figures with the results for the previous years it is noteworthy that the percentage from class B schools is steadily decreasing and the percentage of class A schools increasing.

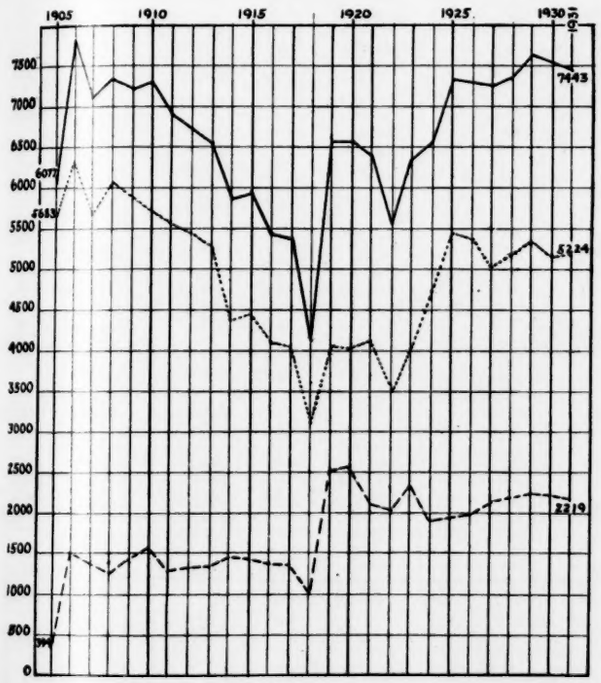

Chart 2.—Registration by examination, reciprocity and endorsement since 1905: solid line, total registration by years; dotted line, licensed by examination; broken line, licensed by reciprocity and endorsement.

Much encouragement should be derived from this table and from chart 3 by members of licensing boards, medical educators, public health and other officials and all public spirited citizens who believe that those who are to be allowed to treat the sick should first be properly and thoroughly educated.

NONDESCRIPT LICENTIATES, 1925-1931

Methods by which the nondescript graduates have been licensed during the past seven years are given in table 8. Some interesting developments in the various states may be noted in this table and in chart 4, which accompanies it. The five chief offenders are Arkansas, California, Colorado, Illinois, Massachusetts and Texas. In California the high numbers admitted by examination represent chiefly osteopaths who have been licensed as osteopathic physicians and surgeons by a separate osteopathic board of examiners, which alone determines the fitness of the candidates. In Colorado there was a general decrease from year to year until 1930, when there was an increase of those licensed by examination, but there was a decrease in 1931. There is a notable decrease of such candidates licensed by examination in Massachusetts. In 1930, Texas accepted no nondescript candidates by examination, which was due to a board ruling in 1925, which required two years of college education, thereby affecting graduates of 1930. In 1931, however, five osteopaths were licensed by examination who complied with this requirement. There has been a decrease in the number of osteopaths licensed by reciprocity in 1931 (*27*).

TABLE 7.—*Source of Physicians Licensed—1917-1931*

	From Medical Colleges in								
	Class A		Class B		Nondescript		Miscellaneous		
Year	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Totals
1917	3,376	62.2	987	18.2	299	5.5	767	14.1	5,429
1918	2,459	58.5	690	16.4	345	8.2	711	16.9	4,205
1919	4,383	66.3	875	13.2	284	4.3	1,072	16.2	6,614
1920	4,623	69.9	635	9.6	279	4.2	1,073	16.2	6,610
1921	4,469	70.0	590	9.2	401	6.3	928	14.5	6,388
1922	4,049	72.7	451	8.1	322	5.8	748	13.4	5,570
1923	4,781	75.0	386	6.1	308	4.8	902	14.1	6,377
1924	5,248	79.2	411	6.5	131	2.0	834	12.6	6,624
1925	5,901	81.2	386	5.3	176	2.4	806	11.1	7,269
1926	6,083	83.6	328	4.5	266	3.7	596	8.2	7,273
1927	6,102	84.2	301	4.2	278	3.8	564	7.8	7,245
1928	6,284	85.0	299	4.1	287	3.9	524	7.1	7,394
1929	6,730	86.6	260	3.3	315	4.1	464	6.0	7,769
1930	6,840	90.4	156	2.1	270	3.6	298	3.9	7,564
1931	6,796	91.3	130	1.7	216	2.9	301	4.0	7,443
Totals	78,124	78.3	6,885	6.9	4,177	4.2	10,588	10.6	99,774

STATE REQUIREMENTS OF PRELIMINARY EDUCATION

There are now forty-three states (counting Alaska and the District of Columbia) which, either by law, board ruling, or both, have adopted requirements of preliminary education in addition to a standard four-year high school education. Of these, thirty-nine require the two-year standard. Before 1908, not one state had any such requirement. One state has no definite requirement of preliminary education, while six states still require only a high school education. It is interesting to note also that seventeen states now require the completion of a year's internship in a hos-

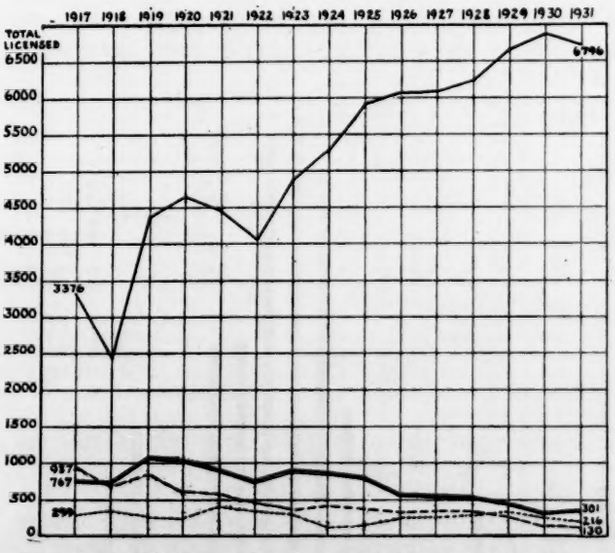

Chart 3.—Qualifications of licentiates: solid line, graduates of class A or approved schools; broken line, of class B schools; dotted line, of class C and nondescript schools; double line, of miscellaneous schools.

TABLE 8.—*Nondescript Licentiates—1925-1931*

	Examination								Reciprocity and Endorsement								Grand Totals
	1925	1926	1927	1928	1929	1930	1931	Totals	1925	1926	1927	1928	1929	1930	1931	Totals	
Alabama	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2
Arizona	2	0	1	0	1	0	0	4	1	0	1	0	1	0	0	3	7
Arkansas	22	8	2	1	30	1	1	65	1	1	0	1	1	0	0	4	69
California	2	47	88	97	94	58	58	444	10	2	8	2	4	2	5	33	477
Colorado	18	44	38	23	10	16	10	159	0	1	4	3	1	2	0	11	170
Connecticut	0	0	2	0	0	1	2	5	1	0	0	1	0	0	0	2	7
Delaware	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
District of Columbia	1	1	0	1	0	0	0	3	2	2	0	3	0	1	3	11	14
Florida	2	3	1	1	1	1	0	9	0	0	0	0	0	0	0	0	9
Georgia	0	0	1	0	0	0	0	1	1	1	0	2	0	0	0	4	5
Idaho	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Illinois	19	40	40	30	35	25	33	222	4	0	0	2	0	2	0	8	230
Indiana	0	0	0	0	0	0	0	0	3	0	0	2	1	0	0	6	6
Iowa	0	0	0	0	0	0	1	1	3	0	0	0	1	0	1	5	6
Kansas	0	0	0	1	0	1	0	2	2	0	0	0	0	0	0	2	4
Kentucky	2	1	0	2	2	4	0	11	0	0	1	0	2	0	1	4	15
Louisiana	1	3	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Maine	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Maryland	1	0	0	0	0	0	0	1	1	2	0	2	0	0	1	6	7
Massachusetts	34	55	39	57	52	81	44	362	0	0	0	0	0	0	0	0	362
Michigan	0	1	0	1	3	0	0	5	1	2	0	0	0	0	0	3	8
Minnesota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mississippi	2	2	1	1	0	0	0	6	0	0	0	0	0	0	0	0	6
Missouri	1	0	1	0	0	0	0	2	0	0	1	2	9	3	0	15	17
Montana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nebraska	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	2	3
Nevada	0	0	1	1	0	0	0	2	1	1	2	2	2	0	1	9	11
New Hampshire	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
New Jersey	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	6	6
New Mexico	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	4	4
New York	1	0	1	1	2	0	0	5	0	0	1	0	2	1	1	5	10
North Carolina	0	0	0	0	1	1	0	2	0	1	0	2	0	1	1	5	7
North Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ohio	1	0	0	1	1	0	0	3	1	0	0	0	0	2	0	3	6
Oklahoma	0	0	0	0	0	0	0	0	1	0	2	1	3	0	0	7	7
Oregon	0	1	0	1	0	0	0	2	0	0	0	0	1	1	0	2	4
Pennsylvania	0	3	1	0	1	0	1	6	0	1	0	0	0	0	0	1	7
Rhode Island	0	0	0	0	0	2	0	2	0	0	0	0	0	3	1	4	6
South Carolina	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	2
South Dakota	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
Tennessee	2	0	0	1	0	0	1	4	0	1	0	0	0	0	0	1	5
Texas	5	4	6	4	10	0	5	34	18	30	19	34	40	56	31	228	262
Utah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Virginia	1	0	0	0	0	0	0	1	1	1	2	0	0	0	0	4	5
Washington	0	0	0	0	0	0	2	2	3	1	0	0	0	0	0	4	6
West Virginia	0	0	4	0	0	0	0	4	0	0	0	0	1	0	0	1	5
Wisconsin	2	0	0	0	0	0	2	4	0	1	1	0	0	3	1	6	10
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
U. S. Territories and Possessions	0	0	3	1	0	1	0	5	0	0	0	0	0	0	1	1	6
Totals	119	214	231	225	244	192	160	1,385	57	52	47	62	71	78	56	423	1,808

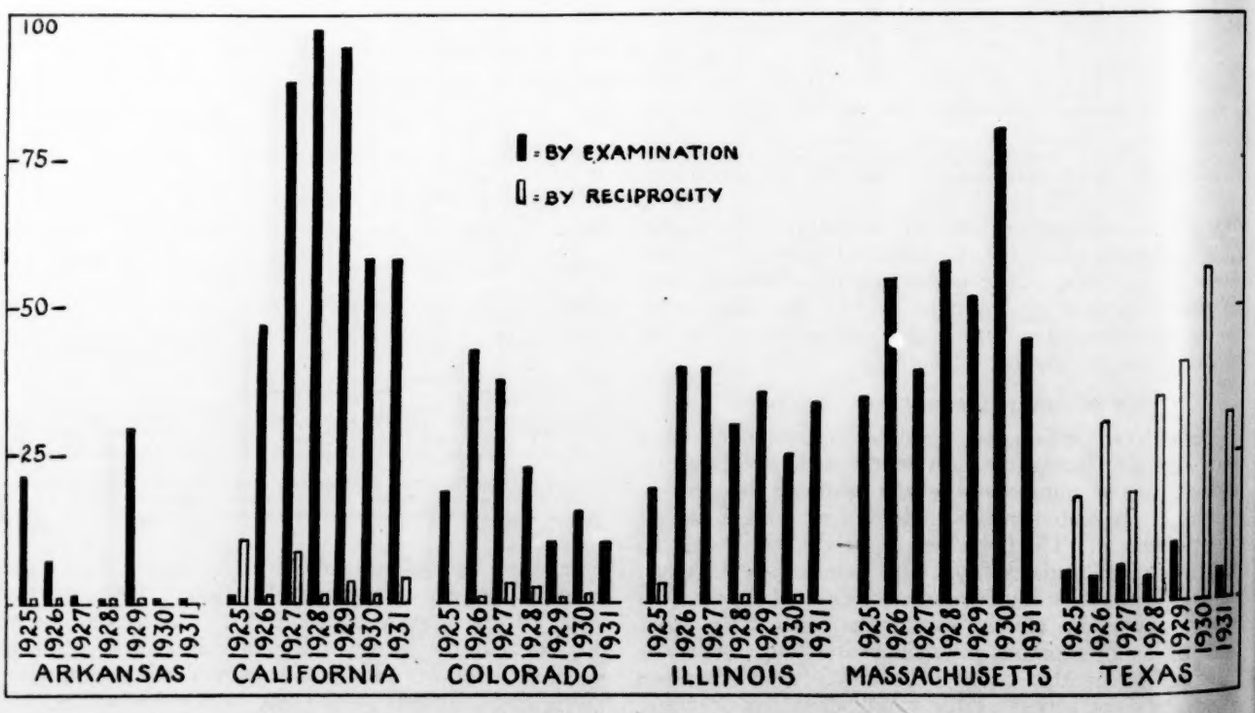

Chart 4.—State licensing largest number of nondescript candidates — 1925-1931.

pital before the candidate is qualified to take the professional examination. All such requirements also have been adopted since 1909.

The states, the number of college years required and the time the higher requirements became or become effective are as follows:

State Examining Board of	One Year of College Work		Two Years of College Work		A Hospital Internship	
	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Applicants
Alabama	.....	....	1915-16	1919	.....	....
Alaska	1914-15	1918	1918-19	1922	1912-13	1917
Arizona	1914-15	1918	1918-19	1922	.....	....
Arkansas	1915-16	1919	1918-19	1922	.....	....
California	1920-21	1924	.....	....	.....	....
Colorado	1908-09	1912	1910-11	1914	.....	....
Connecticut	1915-16	1919	.....	....	.....	....
Delaware*	.....	....	.....	....	1919-20	1924
Dist. of Columbia	.....	....	1925-26	1929	1924-25	1929
Florida	1914-15	1918	1918-19	1922	.....	....
Georgia	.....	....	1918-19	1922	.....	....
Idaho	.....	....	1915-16	1919	.....	....
Illinois	1915-16	1919	1919-20	1923	1918-19	1923
Indiana	1910-11	1914	1911-12	1915	.....	....
Iowa	.....	....	1911-12	1915	1919-20	1924
Kansas	1910-11	1914	1918-19	1922	.....	....
Kentucky	1914-15	1918	1918-19	1922	.....	....
Louisiana	1915-16	1919	1918-19	1922	.....	....
Maine	1915-16	1919	1916-17	1920	.....	....
Maryland	1914-15	1918	1918-19	1922	.....	....
Massachusetts*	.....	....	.....	....	.....	....
Michigan	1914-15	1918	1918-19	1922	1917-18	1922
Minnesota	.....	....	1908-09	1912	.....	....
Mississippi	1915-16	1919	.....	....	.....	....
Missouri*	.....	....	.....	....	.....	....
Montana	1914-15	1918	1918-19	1922	.....	....
Nebraska*	.....	....	.....	....	.....	....
Nevada*	.....	....	.....	....	.....	....
New Hampshire	.....	....	1915-16	1919	.....	....
New Jersey	1915-16	1919	1917-18	1921	1911-12	1916
New Mexico	1914-15	1918	1918-19	1922	.....	....
New York	1917-18	1921	1918-19	1922	.....	....
North Carolina	1914-15	1918	1918-19	1922	.....	....
North Dakota	.....	....	1908-09	1912	1913-14	1918
Ohio*	.....	....	.....	....	.....	....
Oklahoma	1914-15	1918	1917-18	1921	1927-28	1932
Oregon	.....	....	1920-21	1924	.....	....
Pennsylvania	1914-15	1918	.....	....	1909-10	1914
Rhode Island	1914-15	1918	1918-19	1922	1912-13	1917
South Carolina	.....	....	1918-19	1922	.....	....
South Dakota	1908-09	1912	1911-12	1915	1920-21	1925
Tennessee	1916-17	1920	1918-19	1922	.....	....
Texas	1914-15	1918	1926-27	1930	.....	....
Utah	1913-14	1917	1922-23	1926	1921-22	1926
Vermont	1913-14	1917	1918-19	1922	.....	....
Virginia	1914-15	1918	1917-18	1921	.....	....
Washington	1914-15	1918	1918-19	1922	1914-15	1919
West Virginia	1917-18	1921	1921-22	1925	1927-28	1932
Wisconsin	.....	....	1915-16	1919	1922-23	1927
Wyoming†	.....	....	.....	....	1926-27	1931

* Requires a four-year high school education or its equivalent.
† No fixed standard.

HOSPITAL INTERNSHIPS REQUIRED BY MEDICAL COLLEGES

Fourteen medical colleges have adopted the requirements of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the years when the requirement became effective for matriculants and graduates are as follows:

	Affects Matriculants	Affects Graduates
University of Minnesota Medical School	1910-11	1915
Stanford University School of Medicine	1914-15	1919
Rush Medical College (University of Chicago)	1914-15	1919
University of California Medical School	1914-15	1919
Marquette University School of Medicine	1915-16	1920
Northwestern University Medical School	1915-16	1920
University of Illinois College of Medicine	1917-18	1922
Loyola University School of Medicine	1917-18	1922
Detroit College of Medicine and Surgery	1919-20	1924
University of Cincinnati College of Medicine	1922-23	1926
College of Medical Evangelists	1922-23	1927
Graduate School of Medicine of the Division of Biological Sciences (Univ. of Chicago)	1925-26	1930
University of Oklahoma School of Medicine	1928-29	1933
University of Southern California School of Med.	1928-29	1933

BASIC SCIENCE BOARDS

STATISTICS FOR 1931

Basic science boards were established in Wisconsin and Connecticut in 1925, and five other states have since adopted similar plans. Arkansas and the District of Columbia created such boards in 1929, but none were established in 1930 or 1931.

The greatest degree of usefulness for these boards exists in those states which have multiple examining boards. The inequality existing between different boards in demanding varying educational qualifications or none at all was apparent and the introduction of basic science examinations had the advantage of assuring the citizens of the respective commonwealths that all practitioners of the healing art were equally well founded in fundamentals.

The object of these boards has been to provide a means of insuring that all candidates seeking authority to practice any branch of the healing art shall first possess a reasonable knowledge of those sciences fundamental to it as demonstrated by an examination in those subjects before they present themselves to their respective professional boards for examination. The subjects in which examinations are conducted are listed in table 1. They include anatomy, pathology and physiology by all boards, chemistry by five boards, bacteriology and hygiene by four boards, and diagnosis by two.

TABLE 1.—*Subjects of Examinations*

State	Examinations Required in						
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology
Arkansas	+	+	+	..	..	+	+
Connecticut	+	..	..	+	+	+	+
District of Columbia	+	+	+	..	..	+	+
Minnesota	+	+	+	..	+	+	+
Nebraska	+	+	+	..	+	+	+
Washington	+	..	+	..	+	+	+
Wisconsin	+	..	..	+	..	+	+

TABLE 2.—*Applicants Examined—1931*

State	Year Enacted	Physicians or Medical Students P	Physicians or Medical Students F	Osteopaths P	Osteopaths F	Chiropractors P	Chiropractors F	Unclassified P	Unclassified F	Total Examined	Passed	Failed	Percentage Failed
Arkansas	1929	51	4	0	0	0	1	0	0	56	51	5	8.9
Connecticut	1925	84	3	11	3	1	4	0	0	106	96	10	9.4
Dist. of Columbia	1929	23	12	0	0	0	1	0	0	36	23	13	36.1
Minnesota	1927	158	53	13	17	2	6	0	1	250	173	77	30.8
Nebraska	1927	78	14	1	0	0	0	3	6	102	82	20	19.6
Washington	1927	66	5	5	3	3	9	1	2	94	75	19	20.2
Wisconsin	1925	126	3	4	1	3	4	1	1	143	134	9	6.3
Totals—examined		680		58		34		15		787	...	..	....
Totals—passed		586		34		9		5		...	634	..	....
Totals—failed		94		24		25		10		...	...	153	....
Percentage failed		13.8		41.4		73.5		66.7		...	...	..	19.4

In table 2 the results of the examination in 1931 appear. Of 787 candidates of all descriptions who presented themselves, 153 failed (19.4 per cent). Of the 680 physicians or medical students examined, 94 failed (13.8 per cent); of the 58 osteopaths examined, 24 failed (41.4 per cent); of the chiropractors, 25 failed (73.5 per cent); of the unclassified, 10 failed (66.7 per cent). The greatest number of candidates were examined in Minnesota, 250, of whom 158 were physicians or medical students. The highest proportion of failures (36.1 per cent) occurred in the District of Columbia.

The number of certificates granted by examination and reciprocity and endorsement are listed in table 3. Wisconsin accepted the greatest number of candidates from other states, 91, all of whom were physicians. All boards except that of Washington have established reciprocal relations. The basic science board of Wisconsin issues reciprocity certificates to medical reciprocity candidates, from states without basic science legislation on verification from the medical board that

TABLE 3.—*Certificates Issued by Examination, Reciprocity and Endorsement—1931*

State	Examination					Reciprocity and Endorsement					
	Physicians or Med. Students	Osteopaths	Chiropractors	Unclassified	Totals	Physicians	Osteopaths	Chiropractors	Unclassified	Totals	Registered
Arkansas	51	0	0	0	51	0	0	0	0	0	51
Connecticut	84	11	1	0	96	0	0	0	0	0	96
District of Columbia	23	0	0	0	23	0	0	0	0	0	23
Minnesota	158	13	2	0	173	27	0	0	0	27	200
Nebraska	78	1	0	3	82	12	0	0	0	12	94
Washington	66	5	3	1	75	0	0	0	0	0	75
Wisconsin	126	4	3	1	134	91	0	0	0	91	225
Totals	586	34	9	5	634	130	0	0	0	130	764

the applicant's credentials have been accepted, which accounts for the large number certified by endorsement.

Table 4 shows the number of candidates examined and certified from 1927 to 1931. In 1931, 13.8 per cent of the physicians examined failed, an increase of 2.3 per cent over the previous year. The percentage of failures in the nonmedical group is lower than in 1930, but as in the previous year more than half of the candidates failed.

In 1928, when five boards were functioning, there were 646 physicians examined, of whom 60, or 9.3 per cent, failed, and 59 nonmedical practitioners, of whom 28, 47.5 per cent failed. In 1931, with seven boards functioning, 680 physicians and 107 nonmedical practitioners were examined, of whom 13.8 per cent and 55.1 per cent, respectively, failed. During the five year period a total of 2,984 physicians were examined, of

TABLE 4.—*Total Candidates 1927-1931*

Year	No. of Boards	Physicians						Other Practitioners					
		By Examination				Endorsement	Total Certified	By Examination				Endorsement	Total Certified
		Examined	Passed	Failed	Percentage Failed			Examined	Passed	Failed	Percentage Failed		
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	104	710	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	130	716	107	48	59	55.1	0	48
Totals		2,984	2,667	317	10.6	354	3,021	332	155	177	53.3	5	160

whom 10.6 per cent failed, and 332 other practitioners, of whom 53.3 per cent failed. During the period, 354 physicians were certified without examination, while only 5 nonmedical practitioners were granted this privilege. Altogether, 3,021 physicians and 160 others were certified. From the high percentage of failures in the nonmedical group it seems apparent that the enforcement of basic science laws affects most seriously this group.

NATIONAL BOARD OF MEDICAL EXAMINERS

STATISTICS FOR 1931

The National Board of Medical Examiners was organized in 1915. Its certificate is recognized by the licensing authorities of the following forty-one states and three territories:

Alabama	Maryland *	Oregon
Arizona	Massachusetts	Pennsylvania *
California ‡	Minnesota	Porto Rico
Canal Zone	Mississippi	Rhode Island *
Colorado	Missouri	South Carolina *
Connecticut *	Nebraska	South Dakota
Delaware	Nevada	Tennessee
Georgia	New Hampshire	Utah
Hawaii	New Jersey	Vermont
Idaho	New Mexico	Virginia
Illinois *	New York	Washington
Iowa	North Carolina *	West Virginia
Kansas	North Dakota	Wisconsin
Kentucky	Ohio *	Wyoming
Maine *	Oklahoma	

* Certain regulations are required.

‡ A year of residence in some state is required after a candidate becomes a diplomate.

Its examinations are also accepted by the basic science boards of Connecticut, Minnesota, Nebraska, Wisconsin and the District of Columbia. Its certificate is recognized by the United States Army as a scientific qualification for admission to the medical corps. It is accepted in part by the United States Public Health Service. Its diplomates are admitted to the final examinations given by the examining boards of England, Ireland, Scotland and Spain.

Up to Dec. 31, 1921, eleven examinations had been held as follows:

Date of Examination	Where Held	Total Examined	Passed	Failed	Percentage Failed
Oct., 1916	Washington	10	5	5	50.0
June, 1917	Washington	12	9	3	33.3
Oct., 1917	Chicago	28	22	6	21.5
Jan., 1918	New York	20	18	2	10.0
Apr., 1918	Ft. Riley, Ft. Oglethorpe	23	18	5	26.1
Dec., 1918	Chicago, New York	16	15	1	6.3
June, 1919	Philadelphia	52	51	1	1.9
Feb., 1920	Chicago, St. Louis	48	36	12	25.0
May, 1920	Philadelphia	60	46	14	23.3
Feb., 1921	Rochester, Minn.	16	11	5	31.3
June, 1921	Boston	40	37	3	7.5
Totals		325	268	57	14.4

Since 1922, the examinations have been divided into three parts, as follows:

PART I.—Written examination in each of the six fundamental medical sciences: anatomy, including histology and embryology; physiology; physiologic chemistry; pathology; bacteriology, including immunology; pharmacology and materia medica. A candidate is eligible who has met the premedical requirements and has completed the first two years of work in an approved medical school, including training in the laboratory.

PART II.—Written examination in each of the four following subjects: medicine, including pediatrics, neuropsychiatry and therapeutics; surgery, including applied anatomy, surgical pathology and surgical specialties; obstetrics and gynecology; public health, including hygiene and medical jurisprudence. All four subjects must be taken during a regular two-day examination. A candidate is eligible who has passed part I and has completed a four-year medical course.

PART III.—Clinical and practical examination in each of the following four subjects: clinical medicine, including medical pathology, medical anatomy, applied physiology, applied pharmacology, clinical chemistry, clinical microscopy, and dermatology; clinical surgery,

including applied anatomy, surgical pathology, operative surgery, and the surgical specialties of the diseases of the eye, ear, nose and throat; obstetrics and gynecology; public health, including sanitary bacteriology and the communicable diseases. A candidate is eligible who has passed parts I and II and, following his four-year medical course, has completed an internship [5] in a hospital approved by the American Medical Association, or has served a year in an acceptable laboratory. A candidate for part III must also submit satisfactory evidence as to character from two physicians in good standing and from the superintendent of the hospital in which his internship was served.

EXAMINATIONS IN PART I

Three examinations in Part I were held in 1931, as follows:

Date of Examination	Total Examined	Passed	Incomplete	Failed	Percentage Failed
February	245	198	26	21	9.6
June	679	421	211	47	10.0
September	353	137	187	29	17.5
Totals	1,277	756	424	97	11.4
1929	388	263	58	67	20.3
1930	507	349	77	81	18.8
1931	591	415	69	107	20.5
1928	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1925	842	532	231	79	12.9
1924	1,096	675	331	90	11.8
1930	1,258	800	345	113	12.4
1931	1,277	756	424	97	11.4
Totals	7,894	5,078	1,848	968	16.0

There was a slight increase over 1930 in the number of candidates examined (1,277 as compared with 1,258). In 1931, 11.4 per cent failed, while in 1930 the percentage of failures was 12.4. During the past ten years 7,894 candidates were examined, or more than twenty times as many as were examined in the previous six years under the old plan—from 1916 to 1921. Of those examined in part I, 5,078 passed and 968, or 16 per cent, failed.

EXAMINATIONS IN PART II

Three examinations were held in part II, as follows:

Date of Examination	Total Examined	Passed	Incomplete	Failed	Percentage Failed
February	155	128	1	26	16.9
June	439	391	0	48	10.9
September	125	111	1	13	10.5
Totals	719	630	2	87	12.1
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
Totals	3,866	3,387	33	446	11.6

During 1931, 719 candidates were examined in part II, as compared with 620 in 1930. Of those examined, 12.1 per cent failed, while in 1930, 11.4 per cent failed. Altogether, 3,866 were examined during the past ten years, of whom 3,387 passed and 446, or 11.6 per cent, failed.

5. Candidates who expect to practice in the state of Pennsylvania must have had a rotating apprenticeship-internship approved by the Board of Medical Education and Licensure of Pennsylvania.

EXAMINATIONS IN PART III

Examinations in part III were held in several of the twenty subsidiary centers in various sections of the United States. The results were as follows:

Examinations of	Total Examined	Passed	Incomplete	Failed	Percentage Failed
1922	28	28	0	0	0.0
1923	76	75	0	1	1.3
1924	120	114	0	6	5.0
1925	217	206	0	11	5.1
1926	255	243	0	12	4.7
1927	294	272	0	22	7.5
1928	322	306	0	16	5.0
1929	352	336	1	15	4.3
1930	419	399	0	20	4.8
1931	437	419	0	18	4.1
Totals	2,520	2,398	1	121	4.8

In 1931, 437 were examined, as compared with 419 in 1930. Of those examined in 1931, 4.1 per cent failed, while in 1930, 4.8 per cent failed. During the ten year period 2,520 candidates were examined, of whom 2,398 were granted certificates and 121, or 4.8 per cent, failed.

In computing percentages in these tables, the figures given in the column "Incomplete" were not included. An incomplete examination is arranged for candidates taking part I at the end of their second medical year in schools whose third-year curriculums include courses in one or two subjects of this part. The subjects thus postponed may be taken at any examination period after the candidate has completed them in his medical school. Also listed under "Incomplete" are those who wish to spend some additional time on one or two subjects. Final credit is not determined until the candidates have taken the remaining subjects.

Parts I, II and III, Excluding Duplications

Year	Total Examined	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,042	1,545	322	175	10.2
1931	2,218	1,632	410	176	9.7
Totals	13,267	10,081	1,765	1,421	12.4

INDIVIDUALS EXAMINED, 1922-1931

The figures in the table just given represent the number of individuals examined during any one year. The classification as passed or failed, in cases in which more than one examination had been taken in a given year, was based on the results of the last examination taken during the year in question. For example, if in 1931 a student passed part I but failed part II, he is classed as having failed in 1931. Taking this into consideration, there were 2,218 individuals who took the National Board examinations during 1931, as compared with 2,042 in 1930. Only 525 were examined in 1922. The percentage of failures in 1931 was 9.7.

During the ten year period, altogether 13,267 individuals were examined, of whom 10,081 passed and 1,421, or 12.4 per cent, failed.

Diplomates licensed without further examination in the United States increased from 2 in 1917 to 278 in 1931, 1,474 having been so licensed since the board was created.

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SATURDAY, APRIL 23, 1932

STATE BOARD STATISTICS

The statistics of various state board and similar examinations published in this issue reflect the gradual evolution in our methods of licensure of physicians. Special boards in scientific medicine, such as those for the homeopathic and eclectic groups, are gradually disappearing; today there are only five homeopathic boards and one eclectic board. By contrast there are now seven basic science boards and, in addition, the National Board of Medical Examiners. The tendency is obviously toward the establishment of a minimum standard of education for all those who propose to heal the sick and toward the development of one examination accepted uniformly throughout the country.

The licensure statistics may represent the shifting of the medical population; thus it is interesting to observe that the greatest number of licenses in 1931 was granted in New York, and that New Jersey was second, California third and Texas fourth. These are also the states which have granted the greatest number of licenses by reciprocity. For the past five years New York, California, Illinois and Pennsylvania registered the greatest number of physicians, presumably a reflection of the population figures.

Prospective candidates may be interested in knowing which states offer the easiest examinations. In the last five years Georgia, Kansas, Minnesota, New Hampshire, Oklahoma and South Dakota have reported no failures. On the other hand, 50 per cent of the candidates failed in New Mexico, 28.7 per cent in Massachusetts, and 24 per cent in Nevada.

The figures of the basic science boards are particularly enlightening in their representation of the extent to which the nonmedical practitioners are able to meet the fundamental qualifications. In 1931, seven basic science boards examined 680 physicians and 107 nonmedical practitioners. Only 13.8 per cent of the physicians failed, as contrasted with 55.1 per cent of failures among the nonmedical practitioners. The basic science board may be a great aid in combing out the unfit.

ALBUMINURIA IN YOUNG MEN

Albuminuria, like glycosuria, is a symptom never disregarded by the physician after it has been detected. This statement applies not to minute traces of protein or of sugar, which can be detected in many if not almost all specimens of urine by special, refined methods of examination, but rather to the results of the routine chemical tests of the clinician. The diagnosis of "physiologic albuminuria" is never satisfying even in the case of persons who seem to be in the best of health. It is well known that so-called alimentary albuminuria may occur transiently under rather unusual circumstances. Albuminuria has been reported in supposedly normal persons after violent exercise or exposure to cold. Cyclic, orthostatic or postural albuminuria is often dismissed with a favorable prognosis. But the most common and doubtless the most important type of albuminuria is that associated with disease of the kidneys. This always gives serious concern to the physician.

If it were possible to secure early indications of the genesis of nephritic disorder, some advance might be made in the management or avoidance of the symptoms that attend much of the serious illness of later adult years. One approach lies in the study of albuminuria in earlier years. How frequent is it in the adolescent period? Do the cases that appear early bear any significant relationship to the kidney disorders of later life? The Student's Health Service at the University of Minnesota now has records of examinations of 20,000 male students.[1] About 5 per cent of these showed protein in the urine on the examination of a single specimen with the nitric acid ring test. On reexamination in 606 cases of albuminuria, 66.2 per cent showed albumin on only one examination; 13.1 per cent showed occasional albuminuria, 11.8 per cent showed persistent albuminuria, and 6.5 per cent gave evidence of what was probably kidney disease. The calculated percentage of the total group that showed persistent albuminuria and probably kidney disease is so small that, even though there may be some overlapping in the groups, it is evident that kidney disease is a rare condition in young adults.

As possibly contributory factors in the etiology of albuminuria, Diehl and McKinlay[1] have noted a marked relationship between albuminuria, frequent attacks of colds, and a family history of kidney disease; also a slight, though definite, relationship between albuminuria and a history of rheumatism or of scarlet fever. They regard the definite steplike progression in the incidence of several of these conditions from the groups without albuminuria through those with transient and persistent albuminuria to the ones with kidney disease as strongly suggestive that either there are persons with unrecognized nephritis in these groups

1. Diehl, H. S., and McKinlay, C. A.: Albuminuria in College Men, Arch. Int. Med. 49: 45 (Jan.) 1932.

with transient, occasional and persistent albuminuria, or there are some physical or physiologic peculiarities in certain persons that tend toward the development of albuminuria and kidney disease. In either case, Diehl and McKinlay conclude, it is doubtless well to be conservative in one's judgments as to the significance of occasionally finding albumin in the urine, even though with present methods one is unable to discover other evidences of renal injury.

MISGUIDED PHILANTHROPY

One of the saddest spectacles of our modern civilization is the provision of great sums of money left in trust for what may be called antisocial purposes. In a recent survey of this subject, Dr. George H. Mathae [1] suggests that persons of great wealth would do well to consult competent advisers before leaving money for any purpose in the medical field. As a fine example of misguided philanthropy, nothing could be more obvious than the bequeathing of large sums for the perpetuation of the campaign against animal experimentation. Such a campaign is antisocial—against the best interests of mankind. Nevertheless it is difficult, if not impossible, to set aside the purposes of such a trust.

Dr. Mathae feels that there is no sphere of activity in which donors are so ill advised in the selection of the object of their charity as the field of medicine. Frequently vast sums are left for medical purposes to be administered under the direction of lay directors. In such institutions the physician merely acts as a tool for supplying medical science. Sums of money to be devoted to free medical clinics, dispensaries or hospitals may be antisocial in their effects on the progress of the profession and in their pauperization of great numbers of individuals.

There must be a saturation point in the building of schools, hospitals and dispensaries, just as there is a saturation point in the building of office buildings. Today many of our great cities are suffering from an oversupply of office space, so that such structures constitute anything but a good investment. For the same reason some communities are overbuilt with hospitals, whereas others are actually suffering from the lack of a sufficient number of hospital beds. The economist knows that scientific distribution is one of the greatest problems of our modern civilization.

In his consideration of the subject, Dr. Mathae emphasizes particularly the overbuilding of free clinics in communities in which the city, county or state should assume the medical care of the indigent. A physician may reasonably look to the city, county or state for some type of remuneration for medical service given to the indigent, in prestige, research or teaching opportunities. Far too often, all that he receives from free clinics established by private philanthropy is hard work.

1. Mathae, G. H.: Misguided Philanthropy, J. Missouri M. A. 29: 160 (April) 1932.

Current Comment

PHYSIOLOGIC DEATH AND ARTIFICIAL RESPIRATION

Accidents frequently happen in which the victim seems to have been fatally injured and yet the vital organs have not wholly ceased to function. Respiration may cease and the heart stop functioning, producing a state of physiologic death, during which time the victim may sometimes be revived by the proper administration of artificial respiration. This may occur in such accidents as drowning, electrocution and asphyxiation, and in some automobile accidents. The unfortunate and apparently dead victims may not actually die for some time following the accident. Von Hoesslin reported before the Berlin Medical Society that the electrocardiograph has demonstrated regular contractions of the heart continuing as long as thirty minutes after physiologic death occurs. The contractions are strongest immediately following the accident and grow weaker gradually until the heart ceases entirely to function, except for occasional contractions which occur at irregular intervals. Therefore, it would be the period immediately following the accident that normal life may be restored by artificial respiration. Dr. Samuel R. Benedict [1] of the Alabama Power Company believes that many people have died following injuries when they might have been resuscitated if artificial respiration had been promptly administered. The large electric power companies have first-aid teams composed of their employees who are expert in the administration of artificial respiration. These teams have been trained primarily to revive workmen who happen to come in contact with highly charged and dangerous electrical equipment. The public utility companies have thus been able to save the lives of many of their employees. If these companies have not already done so, they should inform the communities in which their expert first-aid teams are located that they are available at any time to administer artificial respiration to any person in the community who happens to be the victim of some such accident. The public utility companies could render a still greater public service if they would offer to provide instruction to the public in the proper methods of artificial respiration. Thus, in extending a service in which some other organizations are already engaged, additional valuable lives may be saved.

ALLERGIC INERTIA DUE TO AVITAMINOSIS

About four years ago, Drs. Sollmann and von Oettingen [1] of Western Reserve University School of Medicine suggested a new technic for the study of pulmonary reactions in experimental anaphylaxis. Their technic consists essentially in perfusing the bronchial tree of hypersensitive animals through the trachea, the perfusion fluid escaping through scarifications on the pleural surface. In guinea-pigs the efferent

1. Benedict, S. R.: A Surgeon's Message to Utilities, Electrical World, Jan. 16, 1932, p. 140.

1. Sollmann, T. H., and von Oettingen, W. F.: Proc. Soc. Exper. Biol. & Med. 25: 692 (May) 1928.

perfusion rate is alleged to be but slightly influenced by allergic edema and mechanical distention of the lungs. The main factor decreasing and at times almost completely stopping efferent flow on the addition of specific protein to the perfusion fluid (Locke's solution) is therefore presumably the smooth muscle reactions, or allergic bronchoconstriction. Applying this technic to a study of the relation of avitaminosis to guinea-pig anaphylaxis, Drs. Hurwitz and Wessels[2] of Stanford University School of Medicine currently report a hitherto unsuspected lack of parallelism between the allergic reactivity of different smooth muscle structures of the same animal body. For example, the usual specific allergic reactivity of the bronchial musculature is not demonstrably decreased by a vitamin C free diet preceding sensitization. There is, however, a complete absence or inhibition of the usual allergic reactivity of the isolated uterine horns (Schultz-Dale technic) on such diets. That two smooth muscle structures of the same animal body show such widely different anaphylactic potentials is surprising but suggests explanations of numerous clinical inconsistencies. The avitaminotic allergic inertia of the guinea-pig uterus is apparently not specific, since it is accompanied by demonstrably decreased reactivity to histamine, pituitary extract, and certain other smooth muscle stimulants.

PROTEINS OF EGG YOLK

Eggs, particularly those of birds, have long had a respected place in the human dietary. In the early days of the development of nutrition as a separate field of science, the peculiar food value of eggs was recognized. The yolk, especially, was held in esteem as a supplement to milk; it was known to contain, in a peculiarly useful form, iron, which the latter lacked. Subsequent studies have shown that the content of iron in the egg yolk cannot be influenced by the diet of the hen. The yolk of the hen's egg is a rich source both of vitamin A and of the antirachitic factor, both of which vary in concentration according to the richness of the feed in these factors. Vitamins B, G and E have also been demonstrated in the yolk. There is a considerable amount of fat and nonsaponifiable lipoid material in this part of the egg, and the proteins of the yolk have been shown to satisfy the amino-acid requirements for maintenance and growth. In a recent review, Jukes and Kay[1] have summarized the available knowledge of the proteins and have pointed out repeatedly the unsatisfactory state of our information concerning them. There are two principal proteins in the yolk, vitellin and livetin, present in the ratio of 4 to 1. The former is always loosely combined with lecithin but may readily be separated from it by boiling with alcohol. When so treated, vitellin is insoluble in water and almost insoluble in salt solutions and dilute alkali but still contains phosphorus. Livetin, on the other hand, contains considerable sulphur and behaves like a pseudoglobulin. It appears that the two proteins are not even in loose chemical combination in the egg yolk; the vitellin is a product of the activity of the egg-forming gland and is characteristic of the yolk as casein is of milk, whereas there is evidence for considering that livetin is closely related to the serum globulin of the hen's blood and is derived from that source. It has long been known that glands do not produce secretion of varying composition, and such analyses as are available indicate that the composition of the egg yolk, so far as the amino-acid constitution of the proteins is concerned, is not changed by feeding the hens with rations containing different proteins. As pointed out by the Toronto investigators, it is striking that the available data on the proteins of egg yolk are so unsatisfactory, in view of the importance of this food material in poultry husbandry and in human nutrition. There is a curious mixture of legend and fact bearing on the chemical composition of egg yolk, the clarification of which, as so frequently happens, awaits the development of suitable analytic chemical methods.

2. Hurwitz, S. H., and Wessels, A. L.: Proc. Soc. Exper. Biol. & Med. **29**: 120, 122 (Nov.) 1931.

1. Jukes, T. H., and Kay, H. D.: Nutrition **5**: 81, 1932.

EXERCISE AND THE HEART

The British physiologist Haldane once remarked that respiration and the circulation may be viewed as the servants of the muscles. Hence, whenever the contractile tissues are brought into action to an unusual extent, the "servants" respond by adjustments of varied sorts, many of which are well known. Most familiar are the immediate responses to muscular work—prompt reactions to facilitate the requisite increased supply of oxygen and withdrawal of metabolic waste, not the least of which may be excess of heat. In health there is a fairly uniform relation between the frequency of the heartbeats and of the respirations. This relation is generally maintained in conditions in which the action of the heart is naturally accelerated, as after exercise. In disease, the expected relation may cease.

There are less well understood adjustments that occur in the body in response to repeated prolonged muscular work. These represent a chapter in the physiology of exercise that has lately engaged the attention of Steinhaus[1] in Chicago. Recently he has presented data to support the view that exercise accelerates the growth of the heart. The investigations on man have led to conflicting results. His method of study consisted in an examination of roentgenographic records of cardiac silhouettes of dogs in which animals undergoing a regular vigorous activity in swimming or running were compared with unexercised litter mates. The conclusion seems warranted that strenuous exercise leads to an enlargement of the heart of growing dogs, which appears within three to five weeks from the beginning of exercise. There are indications pointing to regression in the size of the heart when exercise is discontinued. There is also some evidence that a second period of training following an inactive season is marked, initially, by a further decrease. According to

1. Steinhaus, A. H.; Kirmiz, J. P., and Lauritsen, K.: Studies in the Physiology of Exercise: VIII. The Chronic Effects of Running and Swimming on the Hearts of Growing Dogs as Revealed by Roentgenography, Am. J. Physiol. **99**: 487 (Jan.) 1932. Steinhaus, A. H.; Boyle, R. W., and Jenkins, T. A.: Studies in the Physiology of Exercise: IX. The Chronic Effects of Running and Swimming Exercise on the Hearts of Growing Dogs as Determined Electrocardiographically, ibid. **99**: 503 (Jan.) 1932. Steinhaus, A. H.; Hoyt, L. A., and Rice, H. A.: Studies in the Physiology of Exercise: X. The Effects of Running and Swimming on the Organ Weights of Growing Dogs, ibid. **99**: 512 (Jan.) 1932.

Steinhaus, exercise induces a true work hypertrophy in the heart, which under the conditions of the experiment was more marked in swimmers than in runners. The cardiac hypertrophy involves both ventricles, with just a little excess in favor of the left side of the heart. There is no indication of a comparable hypertrophy of the skeletal musculature of the limbs or of the limb bones. Such studies will be helpful in directing the extension of our knowledge of the reactions of the human heart to exercise during the adolescent period.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday from 12 noon to 12:05 p. m. over Station WBBM (770 kilocycles, or 389.4 meters) and other stations of the Columbia Broadcasting System, and on Wednesday and Friday from 2:25 to 2:30 p. m. over Station WBBM, Chicago.

The program for the week is as follows:

April 25. A Healthy Mouth.
April 27. Why Have Smallpox?
April 29. When May-Day Came to Monarch.

There is also a fifteen minute health talk sponsored by the Association on Saturday morning from 11:15 to 11:30 over Station WBBM, Chicago.

The program for the week is as follows:

April 30. What Mental Health Means.

This schedule is based on Chicago Daylight Saving Time, one hour faster than Central Standard Time.

THE NEW ORLEANS SESSION

Special Taxicab Service in New Orleans

Those attending the New Orleans session, May 9-13, will be afforded the opportunity of effecting considerable savings in taxicab rates in attending the various section meetings as the result of a plan consummated by the Convention and Visitors' Bureau with the Yellow Cab Company of that city, which is operated by Toye Brothers.

Strips of six tickets will be on sale at the principal hotels and the registration desk in the Municipal Auditorium at a price of $1. One of these coupons, together with another from the same strip, or presented by the holder of another strip of tickets, will be good for one ride between any of the hotels at which section meetings are being held, including the Bienville Hotel at Lee Circle, as well as between the Auditorium and the Medical School of Tulane University. In other words, two holders of tickets, or an individual presenting two tickets, may ride to and from any of the meetings held in any of the hotels, the Municipal Auditorium, Tulane Medical School and Jerusalem Temple, where the Woman's Auxiliary will meet, at a price approximately the equivalent for the use of the taxicab of 35c, the regular rate in the downtown area.

These coupons will be good only during the hours of the day when section meetings are held, namely, from about 9 a. m. until 6 p. m., and will not be acceptable for rides to depots or any other points than enumerated.

While the various New Orleans hotels are situated in close proximity and all of them centrally located with reference to the Municipal Auditorium, it is thought that this plan of providing coupon tickets good for taxicab rides to and from the section meetings should assist materially in encouraging attendance at the section meetings and prove of considerable convenience to those who wish to save time in going back and forth.

These tickets are on sale only by representatives of the Yellow Cab Company in the hotel lobbies and at the registration desk in the Municipal Auditorium, and likewise they will be honored only by Yellow cabs. The Yellow Cab Company is the principal operator in New Orleans, with a large fleet of modern cabs.

Only One Thousand Hotel Rooms Left for the Week of the Annual Session

The Hotels Committee, of which Dr. Emmett L. Irwin is chairman, advises that a steady flow of requests for hotel reservations is being received and handled by the committee.

While the Roosevelt Hotel has exhausted its supply of rooms in all categories, there remains an ample supply of double rooms in all the other hotels, although the minimum rate rooms are becoming rapidly depleted and have become exhausted at the St. Charles Hotel and the Monteleone Hotel.

The Hotels Committee likewise states that the supply of single rooms available is rapidly becoming exhausted; however, the suggestion is made that when possible physicians who are acquainted reserve a double room and request a room with twin beds.

The Hotels Committee estimates that there are first class downtown hotel accommodations available in New Orleans for all who may attend and that this supply of rooms may be materially augmented through placing physicians and their families in nearby suburban hotels as well as some of the smaller hostelries.

The Hotels Committee urges physicians to send in their reservations immediately in order that they may be assured a choice of remaining accommodations.

Trip to Mexico After the Meetings

A party will leave New Orleans Friday evening, May 13, stopping first at San Antonio, Texas, and going on into Mexico, Sunday morning, May 15. The trip will be made over the National Railways of Mexico to Mexico City. The principal points of interest will be visited and the party will then proceed by automobile to the famous pyramids of San Juan Teotihuacan. The third day's program will cover Puebla, and for the fourth day a trip to Cuernavaca is planned. The final day will be spent in Mexico City, and on May 20 the party will return to San Antonio. This tour has been planned by the Illinois Central Railroad system. Full information may be had by addressing the representative of the Illinois Central, the Missouri Pacific or the Southern Pacific lines in Chicago, St. Louis, Memphis or New Orleans.

Entertainment for Women Physicians

On Sunday, May 8, there will be a tour of the city through the courtesy of the women physicians of New Orleans, automobiles leaving the St. Charles Hotel at 2:30 p. m. At 7 p. m. the women physicians will be guests of Dr. Elizabeth Bass at a souper buffet à la Creole, in honor of Dr. Rosa H. Gantt, President of the Medical Women's National Association, at the Green Shutter Coffee House, Vieux Carre.

On Monday, May 9, at the St. Charles Hotel, at 12 noon, there will be a buffet luncheon followed by a lantern slide lecture on the work of the American Women's Hospitals in Kentucky and the Carolinas, and at 7 p. m. a banquet at which Dr. Esther Pohl Lovejoy will deliver the inaugural address, "Benefits of Organization to Medical Women," and Mrs. E. M. Gilmer (Dorothy Dix) will be guest speaker.

On Tuesday, May 10, there will be a luncheon at 12:30 p. m. for the life members of the Medical Women's National Association at the Restaurant de la Louisiane.

At the Orleans Club, on Wednesday, May 11, there will be a luncheon at 12:30 p. m. From 5 to 7 p. m., a tea will be given by the local chapter of Alpha Epsilon Iota at the residence of Mrs. H. H. Waters.

On Thursday, May 12, at 12 noon, there will be a picnic luncheon at "Quinta Blanco," the home of the Bolivian Consul and Mrs. Alfredo Blanco, on Bayou Bonfouca, near Slidell, Louisiana.

Women physicians are requested to register for visits to clinics, and institutions and for golf privileges, to buy tickets for luncheons and dinners, and to sign for trips as soon as possible after registering. Tickets may be obtained from the registrar of the Medical Women's National Association at the St. Charles Hotel, and from women members of the registration committee at the Auditorium. Entertainments provided for by the American Medical Association for guests are also open to visiting women physicians.

Medical Veterans' Meeting and Dinner

The Medical Veterans of the World War will have their annual meeting and dinner during the annual session at New Orleans. It will be at the Roosevelt Hotel, 6:30 p. m., May 10, for men only. The speakers will be Major General Robert U. Patterson, Surgeon General, U. S. Army, and Drs. Rudolph Matas, Charles H. Best and Francisco M. Fernandez. Tickets may be obtained at the Registration Bureau or the hotel desk; price, $2.50. All medical veterans are invited. For additional information, apply to Lieut. Col. Henry B. McIntyre, M. C., U. S. Army, 423 Canal Street, New Orleans.

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

Twenty-Eighth Annual Meeting, held in Chicago, Feb. 15 and 16, 1932

(Continued from page 1385)

DR. MAURICE H. REES, Denver, in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 15—AFTERNOON

MEDICAL EDUCATION

The Groundwork for Medical Service

DR. S. MARX WHITE, Minneapolis: Discussion of the groundwork for medical service may conveniently be divided into three chapters or headings:

1. Preparation or training. This should include questions of keeping up with advanced knowledge after the preliminary and formal periods have been completed.

2. The economic basis on which the service rests. This includes not only its own internal organization but, more important, its relation to the community it serves.

3. The spirit animating the service. In a day when material advance has been so rapid that mankind stands confused and hesitant in the presence of his mechanisms, we should be willing to turn, if only for a moment, to our sources of power.

The service already rendered by the American Medical Association and its Council on Medical Education, with the forces and organizations whose support it has enlisted, is incalculable. The surprise is that so much of uniformity and standardization has been possible. In the future, as in the past, results must depend on continued effort and education where it is needed. During the past decade there has been much agitation for a shorter period of training for the medical graduate. There is much to commend the movement for better and less time-consuming methods of primary education and for the drive to begin the premedical and technical training at an earlier age. The multiplying opportunities for training in specialties, with or without an intervening year of internship of a general character, appears to be the most important reason for this urge. It seems clear that the preponderance of informed opinion among medical men is against shortening the period of premedical study and of the medical course itself. To yield to the pressure for more ready and quicker entrance into the practice of our science and art would result in inadequate preparation. Aside from the need for time to acquire the spirit and technic of inquiry, without which a quick lapse into sterility occurs after leaving school and hospital, the content of information needed to be a safe medical adviser today is so great that present requirements are the only safe minimum.

Speaking broadly, the economic principles underlying the provision of medical service will be determined either by the medical profession or by politicians. In the past we have been most influential in determining our qualifications and in setting up standards for ourselves; but pressure from without, political pressure, has left us wofully surrounded with a fringe of inadequately prepared cultists whose chief claim to a following lies in hasty and correspondingly cheap methods of approach to the problems of the sick and disabled. We are quite unaware of the large part that salesmanship, in its broad sense, has played in the inroads these cults make into the legitimate field of the physician. It does not require a prophet to make clear that if through our own leadership, we can continue to provide in adequate form and with proper costs the needed service, then the danger of political control, of debasing conditions and of state medicine can be greatly minimized, and if avoided it will be by these means alone.

What can one say regarding the spirit animating the service that medicine can give? The spirit is that of science; in the practice there is an art. The very needs we are called on to fill lift the response beyond the level of the average man. The long and honorable history of medicine as a profession and of its many followers is ground for just pride. Whenever a renegade appears and puts his interest above those whom he is called on to serve, prompt extrusion from the body of medical men follows. This is not always by withdrawal of the certificate of membership but is, nevertheless, just as readily felt.

The groundwork for medical service lies in proper preparation and training, in an economic basis which will serve the needs of the times, and in a spirit like that of the past, but always ready for change when change is needed. With the necessity for organization if our service is to be effective and acceptable, we must be ready to allow and to encourage many forms of medical service so far relatively untried. The principle of collective effort has already proved capable of adaptations impossible to the individual. It permits a physician to combine in himself the functions of a general practitioner guiding the personal interests of his patient with the function of the specialist following a particular field of study. It is only one of the many forms of organization by which we seek to improve our service in medicine, and by which medical men may continue to guide in medical affairs.

Is the Medical Profession Overcrowded?

DR. C. C. BASS, New Orleans: The answer is yes and no: yes, if the medical profession is to continue to function in the present and past incompetent, imperfect, incomplete, inadequate way in competition with incompetent, nonprofessional people and agencies; no, if it is to function as it could and should for the discovery, advancement, dissemination and practical application of medical knowledge for the health welfare of mankind.

In round numbers there is 1 physician to 2,850 of population in Sweden; in Belgium, 1 to 1,850; in France, 1 to 1,700; in Germany, 1 to 1,550; in England and Wales, 1 to 1,500; in Italy, 1 to 1,400; in Japan, 1 to 1,350; in Switzerland, 1 to 1,250, and, in the United States, 1 to less than 800. Does this mean that the medical profession in this country is overcrowded? Not necessarily. Differences in economic conditions, methods of medical practice, concentration of population, distances and means of travel and many other factors all may influence the need for more or for fewer physicians.

The extent to which the health service needs of the people are met by the medical profession varies in different countries. It is quite possible for the United States to have a larger proportion of physicians per unit of population than any other country and still not have as many as are actually needed or enough for the medical profession to be overcrowded. There may not be as many as are needed in the other countries. Therefore, comparison of the number of physicians per unit of population in this country with that of other countries does not necessarily indicate that there are too many here. Comparison with other countries is not a reliable basis for opinion on this question.

The number of graduates from the schools of this country during the past twelve years has averaged 3,785 a year. The lowest figure reached in the last fifty years was 2,529 in 1922, at which time the maximum effect of the World War on the number of medical graduates was shown. The number has been gradually increasing each year since that time, but it is still far below the high figure of 5,747 in 1904. The total number of graduates for the session 1930-1931 was 4,735. The number of deaths of physicians listed in the two index numbers of THE JOURNAL, covering approximately the same period, was 2,697. This leaves a net increase of graduates over deaths of 2,038 for the year. The net increase of population in the United States is about 1,700,000 a year. The gain of medical graduates over deaths in the year, consisting of the last half of 1930 and the first half of 1931, provides one physician to 834 of population, which is still below the present ratio of 1 to less than 800. Thus it is seen that the number of graduates over deaths is not yet sufficient to maintain the present ratio of physicians to total population. Nor has it been sufficient during the past twenty

or twenty-five years, prior to which time there were more physicians per unit than now. In 1906, for instance, the ratio was 1 physician to 670 of population. We shall have to look elsewhere for evidence of overcrowding in the medical profession.

Public health and hygiene during the past twenty-five or fifty years has increased the average span of life. Prevention of contagious diseases has contributed largely to this lengthening of life expectancy. Prevention of disease is generally thought of as lessening the work of physicians.

The very opposite occurs. A person prevented from dying unnecessarily in early life lives longer to have other diseases for which medical service is required. All ultimately die, but the longer they live the more medical service they require. Preventive medicine actually increases instead of decreases the total income ultimately received by the medical profession.

One thing that has greatly curtailed the income of, and demand for, the services of physicians is the taking over of their work by nonprofessional people. This has been allowed to grow and grow until it has grown almost beyond any hope of control. One who ventures to speak against it now is likely to be misunderstood and criticized as opposing medical and health progress. This practice and near-practice of medicine by people other than physicians has grown up and is most extensive in the fields of preventive medicine under the guise of public health, in laboratory practice, and on a much smaller scale, but equally wrong, in the field of anesthesia.

However, I am quite confident that if the medical profession will include prevention as applied to the individual in addition to curative medicine in their practice and render the type of health service that is needed and is now practical in the light of modern medical knowledge, and if the unnecessary free medical practice by the state is not carried too far, then there will not be any overcrowding of the medical profession for a long time to come.

Some Economic Considerations Influencing the Future of the Practice of Medicine

DR. HUGH CABOT, Rochester, Minn.: The medical profession, though showing great ability to adjust itself to scientific change, has not shown ability to adjust itself to economic change. Too often it has been found in opposition, too rarely leading well thought out investigations and experiments in economic adjustments. Thus, state medicine has been a bogy. Our knowledge of its actual workings has been insufficient to warrant us in the denunciation in which we have frequently indulged. State medicine or its corollaries under other names have improved conditions in other countries but have shown grave weaknesses flowing inevitably from political control. Political control in this country is likely to be even less successful than in other countries. The outstanding achievement in this country appears to me to be the socialization of corporate business. It is not impossible that corporate business with the whole hearted assistance of organized medicine might work out something better than compulsory health insurance. The great life insurance companies of this country have shown great ability in collecting facts and great interest in attempting to develop the field of sickness insurance. They deserve our whole hearted assistance and support. Group medicine is the single gesture made by the medical profession as a partial solution of present unsatisfactory adjustments of health service. It is deserving of far more support than it has received. Group medicine, particularly in the small experiments in the field of university health service, has shown certain interesting possibilities which might with our cooperation and assistance lead to important improvements in the distribution of health service.

Finally, I would point out that the problem appears to me to concern the whole profession. I do not think that it can safely be handled by the constituent societies of this great medical organization. It appears to me to require more detachment from local problems than can be thus obtained, and I am clearly of the opinion that if the medical profession is to throw the weight of its authority behind any existing experiments it must be done from within the central organization of the Association and not by its constituent bodies. The problem appears to me to be more important than any other problem now being dealt with by this association. I do not doubt that, if the power of this association can once be thrown into the scales, the profession will exercise its proper influence on further developments. If this power cannot be welded together and used as a whole, then I shrewdly suspect that we shall end by taking what the political organizations of this country see fit to give us.

DISCUSSIONS ON PAPERS OF DRS. WHITE, BASS AND CABOT

DR. STEPHEN RUSHMORE, Boston: In the growing world for medical service one of the most important things at the present time is that the physician should have a flexible and adaptable mind. The world has always been changing, but at present the changes seem to be very rapid. In order to deal with the rapidly changing situation, the physician must have a mind that is flexible and adaptable. It has been stated that there are two great readjustments which the profession has made: One is to the change in knowledge in recent years, the change in knowledge of the sciences underlying medicine; the other readjustment is to the changing economic situation. The two situations are not comparable. I understand the first advance of knowledge and the appropriate readjustment, but there has been no corresponding advance in the knowledge of economics in recent years in accordance with which the physician might make an adjustment to the economic condition. What has happened is that there has been a marked production in the knowledge which may be applied to medicine. This knowledge has overflowed the medical profession into many adjacent professions or semiprofessions, and the difficulty with which we are confronted is a difficulty of distribution of this knowledge. I know it has been said that the thing for us to do is to stop producing so much knowledge; that is, to go ahead and use up the knowledge we already have. It may keep us going for fifty years perhaps before we can get caught up. Of course, that is a whimsical conceit; but there is a serious side to it, involving the serious criticism of the profession of medicine that we have not developed adequately our means of distribution of this knowledge which has come to us.

DR. WILLIAM GERRY MORGAN, Washington, D. C.: Dr. White has discussed the economics of medical service in a broad way. The only thought which I shall add is that it appears to me necessary that we should attempt to understand broadly just how the real public is viewing the relationship between medical service and their own personal interests. Certain it is that such basic knowledge cannot be gained from what we hear from the platform, from the radio broadcast or from what we read on the printed page, because such utterances are rarely unbiased and are seldom based on any profound understanding of the problem. The question as to whether the medical profession is crowded has been argued and discussed by physicians for the past quarter of a century. Dr. Bass's answer at the opening of his address is sound. There is at present ample room and opportunity for the successful practice of medicine by physicians who are thoroughly equipped in a professional way, industrious, straight dealing and conscientious. There appears to be less and less opportunity for the short-cut doctor whose attention is largely focused on monetary rewards. This type of medical man will find no end of competition and little elbow room. As time goes on there will be progressively fewer doctors who will find it difficult to make ends meet; on the other hand, the number who will receive large returns from the practice of medicine will steadily diminish. In other words, a leveling trend throughout the profession is in process of development. In the last analysis, we come back to the thought expressed by Dr. Bass in his opening sentence, that the profession is not crowded with practitioners of the right sort. To discuss briefly Dr. Cabot's address: I agree with him when he says that "change is the essence of civilization, and that a human organization which ceases to change ceases to be a civilization." Hence, whatever solution to the health problem we are able to work out in this generation will prove at best but another step in the evolution of the service of the medical profession to mankind. Again I agree with Cabot that health insurance under political control will prove in the long run unsatisfactory and detrimental alike to the public and to the profession. Medical service through group clinics could, in the realm of idealism, offer efficient and highly satisfactory medical service to every stratum of society, but does it under its present type of development and can that realm of idealism in the practice of medicine ever be reached?

DR. OLIN WEST, Chicago: I am not one of those who believe that the medical profession is a total loss. Neither can I envisage that very remarkable being described by Dr. Cabot as a great practical philosopher and at the same time a great idealist. I doubt that there has ever been any such animal. I think that one who surveys the wreck and ruin which has well nigh overwhelmed this country for the last two years or more and who can retain a trusting confidence in big business is, to say the most for him, a supreme optimist. And I believe just enough in the common sense and, at the same time, in the idealism of the medical profession to believe that if some of its members had been at the helm we wouldn't have been in such a terrible fix as that in which we now find ourselves. If the medical profession could control the actions of government, the actions of so-called philanthropists, the actions of big business and finance, and at the same time could overthrow a few of the fundamental laws of old Dame Nature herself, it would be perfectly easy to propose some sort of program that might satisfy all the extreme idealists but would play smash with practical things so far as they may be affected by the delivery of medical service. I understood Dr. Cabot to say that the medical profession has always been right in scientific matters and has always been wrong in everything else. I fear that some mistakes have been made in our scientific endeavors that have necessitated corrective action—which has been or will be taken. But I *know* that the profession has *not* always been wrong in matters of practical import. I am a member of a deliberative body composed of representatives of all sorts of groups that recently gave some hours of ponderous consideration to some of these questions affecting medical economics, so called, and finally came to the great glorious decision that the solution of the problem would be for the medical profession to put into effect the plan of instalment paying! Instalment paying originated with the medical profession! I practiced medicine for some years and can't remember that more than 5 or 10 per cent of my bills were ever paid on any other plan. That proposal of the body referred to is just about as worth while as many of these fantastic suggestions that are being offered by some who, I suspect, consider themselves to be "great practical philosophers and great idealists." Talk about insurance companies and their great philanthropic attitude! Let them develop the plans of insurance and see who will control the situation so far as medical service is concerned. I have actually had officers of some of them tell me frankly, "The reason we don't sell health insurance is that we have to control the doctors that deliver the service." Do you believe that the medical profession wants to turn the practice of medicine over to insurance companies? I don't. All sorts of schemes are being proposed and all sorts of experiments are being tried ostensibly to correct defects in the present system of medical practice. Some of them are purely commercial in nature and have been instigated by those who have no knowledge of what is involved in the delivery of medical service and no regard for professional ideals. These schemes, if permitted to develop, will bring disaster to scientific medicine and to the people. Medicine has *not* been absolutely static. Constant progress has been made in developing scientific knowledge and in the improvement of professional methods for the application of that knowledge for the benefit of mankind. In my humble opinion, most of the suggestions for improvement and most of the experiments that have panned out have originated with the profession itself and this will continue to be true hereafter. Just a word about Dr. Bass's paper. I am not altogether sure that Dr. Bass has given the proper answer to his question. He may have left out of consideration some fundamental facts. Our schools are not the only medical schools. We have for years absorbed a part of the product of the medical schools of other countries. In this country we have almost reached the peak of production established when we had more than twice as many schools, many of them far below present standards and some of them pure diploma mills. In the meantime good roads, automobiles and telephones have made it possible for the physician to render more and better service in less time; many hospitals have been provided, and there has been a tremendous reduction in the prevalence of certain diseases that formerly kept doctors going day and night through whole seasons. Approximately 3,000 physicians die each year, but our own schools are producing nearly 5,000 each year. One very practical phase of the situation has come under my observation many times. Young men are turned out into practice who are under the necessity of earning their living at once. Many of them have pressing debts. They find it difficult to secure income sufficient to meet their actual needs. Many of them become discouraged and look for "jobs" that will bring them ready money. If the jobs are found, they take them. If jobs are not to be found they proceed to make them, if they can, and too often they are made on terms that ignore professional ideals and ethics. It is out of this very situation that some of our most harrassing problems have arisen. Dr. Bass's answer to his own question may be correct, but perhaps it has not been fully proved. Some official body should endeavor to provide a conclusive answer.

DR. W. H. MACCRAKEN, Detroit: It is hard in these days to be particularly optimistic, especially if one listens to a great many papers in the course of a year. I ran across a paper the other day in looking over some that helped me quite a bit in this connection. My grandfather was a physician who had the pernicious habit of writing papers and then reading them before medical societies. I encountered a paper just 110 years old that he read before a medical society in the East. Two or three things he brought out in that paper were these points: One was the encroachment of the cults on the field of legitimate medicine. Another was the utter failure of the medical profession to adapt itself to the rapidly changing economic conditions of his time.

DR. MORRIS FISHBEIN, Chicago: We all realize that the great economic and political changes that take place come in one of two ways: either by evolution or by revolution. When they come by evolution they come slowly; they are adapted to the needs of mankind. When they come by revolution they come rapidly, and in most instances the revolution goes too far. I do not believe that any of us is foolish enough to suggest that the medical profession should turn over to big business the question of controlling medical practice. The workers themselves may wish to be consulted concerning the idea that hereafter their medical care will be a matter of control by the big business which employs them. I do not believe that the guild or group practice is the answer to the problem. If group practice were the answer to our present medical situation, we would have had, in a time of economic stringency, a considerable increase in the number of groups. What has happened is a decrease in the number of groups, some of them going bankrupt because they were unable to collect the high fees they were used to collecting. The group is not in any sense of the word an answer to the problem of providing medical care in times of economic stringency or of providing good, economical care. The group is merely one system of medical practice that is especially adapted to taking care of 10 per cent of the serious illnesses. Ninety per cent of the illness that constitutes the majority of medical practice must be and probably always will be taken care of by general medical practitioners. Medical specialties take care of only 10 per cent of serious diseases. In connection with the suggestion for increasing the economic return to the physician by lowering the number of physicians or by getting rid of technicians, the growth of the technician in medical practice is merely a response to a definite economic demand. The technicians in laboratories, in physical therapy, even the cosmetologists and chiropodists, are a response to the demand for specialized medical work that in many cases the physician does not want to do. The main point is to make the technician realize that he is not a physician and that he should limit his practice actually to the small part of medical technical work he has been trained for. I did not come here expecting to be enlightened or startled by the sudden production of a magnificent plan for solving the problem of medical care, and I am not going away disappointed. I don't believe the answer will come suddenly. It will come by gradual evolution and adaptation of modern medical science to modern economic needs.

DR. LEWIS J. MOORMAN, Oklahoma City: In connection with the subject which has been discussed here this afternoon, it is quite evident that no solution is in prospect, and since it was discussed 110 years ago and every hundred years previous to that, it might be well for us to consider the advisability of proceeding as the medical profession has proceeded in the past,

on honorable, sound principles, in the light of the knowledge we have, with earnest endeavor in our service to humanity, with the hope that such endeavors will have due recognition and remuneration. I should like to ask whether the Committee on the Costs of Medical Care has given due consideration to the increased cost of giving scientific medical care. It costs a physician much more today than ever before to give care in the light of modern scientific advancements. Therapeutic measures have become much more technical, and diagnostic measures depend on more expensive equipment. I think it would be well if the people were informed with reference to the increased cost of giving medical care.

DR. JOHN W. MACCONNELL, Davidson, N. C.: These things are not problems that do not solve themselves. They solve themselves economically and professionally. In other words, the public sits on your work and mine. There must be a certain measure of state medicine and there must be a certain measure of private medicine. At present I see no tendency, even for the public, to demand more state medicine. I know that this hospitalization of the veteran of which Dr. Wilbur spoke this morning is a serious problem, but I do not, in North Carolina, see any particular trend of the public to demand more state medicine. They demand more medical attention but they want it from the practitioner.

DR. HUGH CABOT, Rochester, Minn.: I am not sure that we quite visualize our own position in relation to the state. To a large extent in all states in the Union there has been created for us a legal monopoly. In some states that is practically an absolute legal monopoly. If you will watch the history of legal monopolies under a democracy you will see that they are first established, as a rule, at the request of some group which desires, and properly, to secure their position. But that leads inevitably to regulation on the part of the state and to further and further intervention on the part of the state. The state has not set up the medical profession as a practical, legal monopoly for the purpose of benefiting the medical profession. It sets it up, and I think we will all agree, wisely, for the sake of benefiting the public. The question of the extent to which the state will invade the practice of medicine will not be decided by those for whom the monopoly has been created but by those who created the monopoly. In other words, we would not be consulted on this matter. I belief that we shall, particularly in times of depression and if these depressions are going to continue, find the thing done very suddenly and without very much forethought.

New Ideals in Clinical Fellowships

DR. CHARLES E. REMY, Minneapolis: A year ago our medical service at the Minneapolis General Hospital was covered by four resident physicians. At the same time that this medical resident service existed in the hospital the city carried on its payroll four physicians known as assistant city physicians. It was the duty of these men to respond to the calls from indigent homes of the city for a physician. In addition to a salary they were permitted to carry on a regular private practice.

In July, 1931, the services of assistant city physicians were discontinued and arrangements entered into with the Graduate School of Medicine for the financing by the Minneapolis General Hospital of a certain number of fellowships in the Graduate School of Medicine. The Minneapolis General Hospital undertook to finance four medical fellows in addition to the two fellowships maintained on the medical service by the university.

It was arranged that four of these medical fellows should be on duty in the hospital and that two of them, with cars provided by the Minneapolis General Hospital, should take over the duties of the four part time assistant city physicians. It was further arranged that the six medical fellows should rotate in pairs on the home visiting service. In other words, two of the fellows went on home visiting service for a period of four months, at the termination of which period they came into the hospital, replacing two of the fellows on ward service, who in turn took their place in the home visiting service.

We think that we have accomplished several things by entering into this arrangement. In the first place, we have cooperated with the Graduate School of Medicine and provided four additional fellowships—four postgraduates in the school. Secondly, we have provided for our medical fellows a service which corresponds very closely indeed to the service which they will enter on when they go out into independent practice themselves. We have provided that these men may get their first experience and what corresponds to private practice under the direction and guidance of a capable internist. In the fourth place, we are enabled to care for many patients in the home for long periods of time who would otherwise be occupying beds in the hospital and producing a certain stasis in the hospital ward services. Lastly, we believe that we are giving much more prompt and efficient service to the indigent citizens of the community than it is ever possible to provide through the medium of part time service of practicing physicians whose foremost interest must necessarily be in the establishment of their own private practice. It may be mentioned as an interesting fact that the first month this service was established the number of calls made jumped to better than 800 for the month, as compared with 385 for the preceding month. Since the first of July the home calls made have continued to increase, and at present our home visits number better than 900 a month. So much for what we are doing by the way of medical fellowships.

Now I would like to say a word about our surgical fellowships. A year ago, and for some time prior thereto, we had two surgical fellows assigned to the General Hospital by the Graduate School of Medicine. At the same time that these two surgical fellowships were being maintained by the university the General Hospital was employing three assistant city physicians whose duty it was to take care of the emergency and receiving service of the hospital. Two of these men were paid $1,800 a year, with full maintenance, and a third man took care of the emergency and receiving service from 11 p. m. to 7 a. m. and was paid $900 and full maintenance. In other words, the hospital was paying a total of $4,500 and full maintenance for three men to take care of its twenty-four hour emergency and receiving service, a service which in itself offered some of the finest experience for persons surgically minded and surgically inclined. Considering the possibilities for the Graduate School of Medicine in this emergency and receiving service at the General Hospital, we offered to the Graduate School of Medicine four additional fellowships in surgery, provided the full three years of such fellowships be served at the General Hospital. The General Hospital finances the four additional surgical fellowships.

It is our belief that these rotating surgical fellowships are not excelled for value by any fellowships offered in the United States today and that similar types of fellowship might advantageously be offered by many of the medical colleges.

Time does not permit our entering into details as regards the other types of fellowships now being offered in the Minneapolis General Hospital, but it may be well to mention that there are three fellowships in pediatrics, two in obstetrics and gynecology, one in eye, ear, nose and throat. We have unpaid resident services in dermatology, in pathology and roentgenology and look forward to the day when all of these can be made fellowship appointments with the regular fellowship remuneration.

DISCUSSION

DR. E. P. LYON, Minneapolis: I am in favor of the plan. I think Dr. Remy has suggested a method by which a considerable number of men may receive advanced training and become high-grade specialists in various lines. I am afraid that we shall not promote the work of research and the work toward a higher degree which the graduate school, of course, is primarily in existence for. The graduate school is not primarily concerned with graduating specialists; it is concerned with higher education and research. How is this different from the ordinary scheme, from the medical personnel which hospitals have? It is different in its psychology. The fellow is looked on primarily as a student. He has his obligations to the university and to his superiors. I think it is a relation of a teacher to a student rather than simply that of a superior to an assistant. That is why it seems to me there is an advantage in the whole system by which these men would be there. Of course, they would have to be there as assistants or whatever you call them, residents, whatever it might be. But they get a different slant on why they are there, provided they have this relationship. Therefore, I am very much in favor of our plan all the way round.

DR. CHARLES E. REMY, Minneapolis: The doctor sitting beside me raised a point. He said that 800 or 900 visits a month

seemed like an insurmountable thing. I failed to bring up this point: With our medical fellows, two are on home visiting; then those two are brought in and go on house service, and two others go out on home visiting. After a short while they come in and others go out in their stead. As it happened in the last two weeks, when we have been just swamped, our men have been making not only 800 but better than 1,000 calls, an average of 1,000 calls a month if the daily average of the last ten days are considered. It is true, we had to call on some of the men in the house because the men who were on the service outside and making so many calls a day were just exhausted. Strange to relate, they were not discouraged or embittered by the matter. They were rather enthusiastic over the amount of actual practical medical experience they were getting, although disappointed by the fact that in this tremendous rush they didn't have the time to give to diagnosis in the home which they ordinarily desired to give. We have been able to take two men from the house when the other two men were exhausted and thus rotate the service through the six men.

FEBRUARY 15—AFTERNOON

DR. H. DOUGLAS SINGER, Chicago, in the Chair

HOSPITALS FOR THE TREATMENT OF NERVOUS AND MENTAL PATIENTS

Integration of Universities and State Hospitals in Handling Mental Diseases

DR. W. F. LORENZ, Madison, Wis.: The state hospitals mark a great advance, and their era should be viewed as a tremendous accomplishment. They provide admirably for the problem of mental disease as it exists today, but they contribute very little, if anything, to reduce or eliminate the conditions that create the problem. For the most part, our state hospitals are monuments to house our medical failures. Easily 75 per cent of the patients in any large state hospital are chronic cases, residuals in whom we have been unsuccessful as physicians.

I suggest that the most practical way in which the next advance in the handling of mental problems can be accomplished is to move a part of the problem to a place where most of the facilities for research already exist. That is, at a university where the medical and other sciences are being taught and research is carried on.

The ordinary type of clinical research that can be accomplished in a state hospital, while by no means exhausted from the standpoint of possible contributions, is not wide enough to take in the varied and highly complex causes that seem to be operating in the field of mental diseases. I believe one must go much further in this problem and call not only on the medical sciences but also on other related fields, such as biology, genetics, chemistry, sociology, psychology or any other field of learning that has a contribution to make. In some of our work we have received help from the department of animal husbandry. An isolated psychiatric institute financed by a state could not very well provide such a wide scientific survey. It is only at a fully developed, large educational institution that such facilities exist. Furthermore, our present knowledge is insufficient even to outline problems that would keep some of these nonmedical scientific departments fully employed. At the very best, only a part of such facilities could at present be applied to part of the problem that presents itself, and it is because of this situation that the term "integration" was chosen.

I would advocate a hospital or department in a general hospital in connection with the university as the next step that should be generally adopted throughout the United States. To make such an institution effective it should in some manner be a part of the state hospital system. Its bed capacity can be adjusted to the general size of the problem; but for the purposes of thorough investigation and to meet some of the other advantages that will be stressed, this addition to our state system should have a bed capacity of not less than 150 or 200 beds.

There is an immediate result from the integration of the university with the state hospital system bearing directly on the whole problem. The patient received at such a hospital is regarded as being sick. He constitutes a medical case and not a legal problem. Commitments by courts would rarely, if ever, be required at this phase of the hospitalization. The public would not view with fear and apprehension the patient who has recovered under such circumstances. The utmost in the nature of clinical examination and therapy would be applied. The changed relationship with the public would result in more cases coming under medical supervision at an earlier period of the illness. Many cases developing on a physical or toxic basis are cured within a period of two months or less. Such patients will have escaped the stigma of commitment and need feel no worse over their experience than those recovering from typhoid or pneumonia. The entire setting in which such a patient finds himself is that of a medical institution or hospital. This cloaks a situation which is still technically, legally and popularly regarded somewhat in the nature of an offense and antisocial, although the person concerned is wholly innocent. In other words, it emphasizes the essential medical character of mental illness which conception itself seems to need endless reemphasis. In short, the possibilities for recovery by the best possible medical treatment is definitely enhanced, and the recovery, so far as adjustment to society is concerned, is much more complete.

But possibly even more than this will be accomplished, which might in itself warrant affiliation of the university. Medical education would be enriched by the student making a close contact with the various types of psychosis treated at such a hospital. He would be much more competent to handle scientifically the purely mental reactions associated with practically any disease. That states of mind may affect physical disease either favorably or adversely I dare say is a commonly accepted clinical experience. Knowledge of the mental reactions to disease and consideration of these in the therapeutic effort is quite erroneously regarded as the art of medicine. This can be and should be a science taught and practiced during student days. This possibility is enhanced if the student receives some of his training in a psychopathic hospital or department. Briefly put, any practitioner of medicine in its general application or any of its special branches will be more effective if reasonably well equipped in the broad field of psychiatry.

The Advantages of Complete State Care for Mental Patients

DR. F. A. CARMICHAEL, Osawatomie, Kan.: Not only does the problem of mental disease challenge our attention because of the progressive increase of this disorder from year to year and the large number of patients at present hospitalized, but also because of the special provision necessary for the adequate care of the cases over a long course of treatment, and furthermore in those cases in which recovery does not occur, at least not to the point of economic efficiency, facilities for continued care that will as nearly as possible approximate normal interests and activities must be provided. This elaborate preparation and the equipment, requiring as it does a heavy investment of capital, makes it almost imperative that it be undertaken by the commonwealth. Private institutional care is expensive and can be made available only to the more prosperous classes. Therefore its range of applicability is limited. Unfortunately the great majority of mental patients are indigent, either as a result of impaired economic efficiency antedating the acute mental breakdown or owing to other factors which tend to deplete their financial state, and because of this fact state supervision becomes a necessity. A division of responsibility or authority between the county and state, or between city and county, has not so far as I can learn ever proved a satisfactory arrangement. The Western states as a rule furnish complete state care. In some, arrangement whereby the expense of the patient is charged to the county from which he is committed exists. However, economic disturbance may seriously affect one part of the state while not affecting another and cause considerable difficulty in a proper redistribution of the burden of institutional care. In my own state, complete state care has existed from the establishment of its first institution. Nothing is required of the counties except an initial clothing requisition for indigent patients. In the years that I have been in state service I have found little to criticize in this arrangement. There are no serious elements of uncertainty. Per capita costs and more or less fixed revenues permit an accurate estimate of appropriations and budget requirements from year to year. There is a single agency and source from which appropriated funds may be secured. While we are obliged to deal with legislatures that

are sometimes finicky and unresponsive, and always argumentative, these are in the main sound at heart and as a rule concede the necessary funds for maintenance, although efforts looking toward the extension of beneficent hospital functions are not enthusiastically welcomed. There is no conflict over questions of expansion, maintenance or management. The only unfortunate factor is the occasional intervention of politics which, while it does not seriously affect the resident personnel of the institutions in most states, hampers to a considerable degree the progress of institutional advancement because of the lack of intimate knowledge of the main objectives sought.

Through the agency of state or federal government only can effective social service be initiated, adequately maintained and administered, permitting the hospital to extend its beneficent function as an extramural service, which at present is sadly needed. The opportunity for community service, if sponsored by the resources of the state, is unparalleled. No other type of care for the psychotic patient can be as efficiently and economically administered as that supplied by the state.

The opportunity of utilizing the rich clinical material in our state maintained hospitals is being eagerly grasped by medical schools, and one of the great advantages of state care is the wealth of clinical material of neurologic and psychiatric nature that is made available for teaching purposes. A few years ago the clinical facilities of our state institutions were tendered the medical department of our state university for teaching purposes and were rejected with rather scant courtesy. This rejection implied that clinical psychiatry was not sufficiently important and must be sacrificed to teachings then regarded as of higher value to the student. In recent years, I am happy to state, the medical department of our university has eagerly availed itself of the opportunity for clinical psychiatric training of its students. Necessarily, economy of administration without sacrifice of adequate care strongly emphasizes the superiority of complete state care of the mental patient.

DISCUSSION ON PAPERS OF DRS. LORENZ AND CARMICHAEL

DR. CHARLES F. READ, Elgin, Ill.: Without at all criticizing the plan as laid out by Dr. Lorenz and as already accepted, one might ask if it is not possible to use state hospitals already in a going condition and near educational centers. After all, space is being rapidly conquered. An institution 10, 20 or 40 miles away from an educational center is very accessible. There ought to be free interchange of ideas between the staffs, the professors of the university, and the staffs of the various state hospitals in the adjoining communities concerning the problems mutual to them. I think possibly such a plan is going to work out in Illinois in time. Already we have a psychiatric institute and hospital in connection with the Research Hospital. They have another laboratory under the direction of the state alienist situated in connection with the Elgin State Hospital, which itself is only 35 miles away from the medical center of the University of Illinois. I feel that with this set-up, with more coordination and with more complete exchange of ideas we might very well push along the lines as suggested by Dr. Lorenz. Dr. Lorenz has called attention to the fact that we should consider these cases as medical cases; certainly with considerable emphasis on the medical side of the problem. But why shouldn't a state hospital be made into a general hospital to a very considerable extent? So far as Dr. Carmichael's paper goes, in Illinois we have many hundreds of soldier patients under such care as we feel is entirely comparable to federal care, and we are doing it at about the cost of $1 a day as against the $4 or $5 which I understand the federal government is spending on it. I believe the patients are perhaps as well satisfied as they are in federal hospitals. As for government measures for the prevention of mental disease, the government has not succeeded very well in the Volstead Act. Alcoholism accounts for perhaps 10 or 12 per cent of our state hospital populations, directly and indirectly. The solution of the problem of arteriosclerosis is in the hands of the medical profession at large. How far the government can help us, I am not sure.

DR. GEORGE A. JOHNS, St. Joseph, Mo.: I would like it understood that I speak somewhat from the point of view of one in a state hospital. I think there are many conditions prevailing in our state hospitals today that are not generally understood, at least by those who have never had contact with the hospitals. I should wish to avoid an injustice to the physicians in saying they are at fault for the increased insanity as presented by the constantly growing state hospitals. As the social and economic conditions become increasingly complex and competition keen, we must expect to encounter and provide for more of the human by-products of a highly complex civilization. The burden must be borne somewhere, and the selling, liberalizing and generally expanding service of the state hospitals is one of the natural consequences. I would take exception to the statement that our state hospitals are monuments to our medical failures. I don't believe it rests solely there. I think it is largely a social problem and an economic problem and not purely a medical problem. The physician's responsibility in this respect is relatively small, and the good he has done throughout these many years has been accomplished despite almost overwhelming obstacles seldom realized, except by those long in contact with and on the inside of these institutions. The growth of state hospitals is not alarming to me but, on the contrary, encouraging. They are many times more efficient than the home, the jail, the poorhouse or any alternative I can think of. They are exceedingly cheap and wonderfully efficient in terms of benefit to the patients, their families, and the community. I would approve every effort further to hospitalize and elevate the standards of state hospitals. It would be better for the state hospitals to set the standard for private hospitals or other hospitals than to be allowed to trail in the wake of the other hospitals more or less shunned and avoided or to continue as they have in the past. Speaking for the physicians in the hospitals, no one in the state will welcome, more readily or more heartily than we shall, connection with our state universities.

DR. M. A. BLISS, St. Louis: It seems to me a hopeful thing that the American Medical Association is beginning to take an interest in the mental hospitals throughout the country. We must always recall, however, in any suggestions such as have been made by Drs. Lorenz and Carmichael, that we must go back to a legislature composed of elements that have very little comprehension or understanding. As a rule, they are not so coldblooded and hardboiled, but they just don't know, and it seems to me that the great problem here is to get before any sort of public body the fact that we want to put it on a perfectly honest basis. In reference to the suggestion of Dr. Lorenz, I have this thought: There are a good many private universities having medical departments that are seeking rather eagerly now for the development of psychiatry in their schedules. That is true of one of the universities in my state. They offered two years ago that if we would build a state hospital near there, easily accessible to them, man it and equip it, they would, in exchange for the teaching privileges, furnish us all forms of consultation service. It seems to me that is a possibility that might be worked out.

DR. FRANK P. NORBURY, Jacksonville, Ill.: I wonder if any of you recall that the experiment of which Dr. Lorenz speaks as existing now really began in Indiana in 1896. Dr. Edenharter, who had been superintendent of the city hospital in Indianapolis, inaugurated a special teaching hospital and had the building erected on the grounds of the central hospital at Indianapolis. It was my privilege and pleasure to be there in 1896 to assist in opening that institution. Not only that, but that course has been pursued there ever since. After Dr. Edenharter's death, it was carried on by Dr. Bahr. Some of the most constructive work done in the Middle West was done by Dr. Bahr along the lines of Dr. Lorenz's work; that is, in the study of syphilis. We have a good institution especially designed for research. Like all institutions maintained by taxation of the state, this institution has had its ups and downs. There have been years when there has not been revenue enough to carry the thing through according to the plan Dr. Edenharter laid out. I was back there in 1916 or 1917 and assisted in the dedication of another building designed to promote this very line of work of which Dr. Lorenz is speaking.

DR. B. D. MYERS, Bloomington, Ind.: Our civilization cannot stand if there is a constant increase in crime, feeblemindedness and insanity. Now, then, what is the answer?

To my mind, the only answer is that which Dr. Lorenz and others here have suggested. I saw it first in 1910 when I spent a couple of weeks with Kraepelin in Munich. He had there a little hospital of about eighty beds, and from all over southern Germany patients came to Kraepelin's hospital. Many of them were sent back home without ever having been in an institution for the insane, without any of that stigma, which of course wrongly attaches to such cases. I believe that is the kind of thing we need here. Suppose it could be done in an institution for the insane, there would still be the stigma of an individual having to go to an institution for the insane. The psychiatric unit in connection with the university hospital is the answer to the problem. It isn't that we do not have it. I know the Bahr and Edenharter institution that Dr. Norbury referred to. From the standpoint of medical instruction, it has splendid facilities, but I don't believe that it is proper to send patients in the acute stage there. As long as there are psychiatric units to which patients can go with no more fuss and feathers than the hospital where one goes to have an appendix out, they will go early and come back cured, many of them, and without the stigma of having been in an institution for insane patients.

DR. C. C. BURLINGAME, Hartford, Conn.: It was my good fortune to be interested in the state institution when it was made the New York Medical Center. I have come to the conclusion that the psychiatric institute is not so much buildings and not so much location as it is a state of mind, and personnel. You can get that state of mind where you are. If you wait for the ideal and the perfect, you will never get there. I see no reason at all why each man can't go home and go over his assets and see what he can do to get on the road Dr. Lorenz has pointed out as ultimately the best. There is one other point I should like to bring up. I hope we shall stop going before the legislatures bragging about how cheaply we are running our places, and our per capita cost. God knows we never got anywhere bragging about how cheaply we took care of patients in the babies' hospitals, or in the paupers' institutions that we have been running. I hope somebody will have guts and backbone enough to say, "Thank God it costs more to run this institution than any other place in the country because we are doing the best work." We will spend the rest of our lives and get nowhere (and we have been going on with this dribble for the last twenty years that I know of; I have been at it for twenty-two years) talking to legislatures about per capita cost. It ought to be forbidden by law. If we talk about what can be done if we have the money and the assets, we will get somewhere.

DR. W. F. LORENZ, Madison, Wis.: I have the highest regard for the state hospital as such. I merely maintain, however, that it has a job and it does that job extremely well, but that job in itself is not a fundamental solution, and we must all be restless to take another step, and that step means among other things, of course, educating the public and, I also feel, educating the profession. I am fully aware now and had I known it beforehand I probably would not have read this sort of paper before this audience, because it is bringing coals to Newcastle. I know that. It was nothing different than that which has been advocated many times and to which all of you could subscribe. I also realize that in many states the suggestions can be worked out in ways other than those suggested in my communication. I wish particularly to subscribe to the remarks of the last speaker, who brought out the fact that we put ourselves in a very vulnerable position when we try to argue how cheaply we can do a job. I have always made it a practice to justify a large expense, and I find that, strangely enough, it is more successful than when I seek to argue on the other basis.

DR. F. A. CARMICHAEL, Osawatomie, Kan.: There are a few things that I think it might be well to say in reference to state hospital care of mental cases. We must view it from two angles: first, the humanitarian angle; second, the economic angle. Politicians and legislators as a class have only one eye, and that is on the economic side of the question. One of the great difficulties in our state hospitals is that we are critically understaffed with physicians. No matter how bright, no matter how energetic, no matter how willing to work a staff member may be, because of the exigencies of limited appropriations and salary schedules his time is largely consumed in fruitless routine and in detail which ultimately plunges him into a useless round of activities, which he performs day after day without achieving anything. He doesn't have time for research work. If he has time to read, he does it at night. Undoubtedly, it would be one of the best things for our institutions to have a contact with the state university. In our institution for the last few years, since we have been attached to the state university in a clinical capacity, not definitely in the teaching capacity but in giving the students a certain amount of training in clinical psychiatry, we have been tremendously stimulated by the young men who come into the institution for this work. We have been able to give them something which will undoubtedly be of great value to them, no matter what line of specialty or what line of work they take up later. The kernel of the whole thing is that those of us who are professional men don't know anything about the politician. The politician looks at no other end than his own political advancement, his personal aggrandizement and his apparent usefulness to the party. Everything he does is largely from that standpoint, and I speak of the average politician.

Preliminary Report of Survey of Hospitals for Nervous and Mental Patients in the United States

DR. JOHN M. GRIMES, Chicago: This report, for the Council on Medical Education and Hospitals, was published in full in THE JOURNAL, March 5, page 839.

DISCUSSION

DR. FRANKLIN G. EBAUGH, Denver: The participation of the American Medical Association in the present program for the study of both public and private hospitals for the care of the mentally ill constitutes a most significant step forward. It is difficult to understand why this fundamental study of mental hospitals has been put off so long, although there has been considerable discussion, keen insight and desire to complete this difficult task by the American Psychiatric Association for many years. The facilities, however, and the funds to do the high type of work desired were not available. In this step forward it seems to me that the plan of the Council on Medical Education and Hospitals of the American Medical Association to complete this undertaking gives psychiatry a remarkable opportunity for a pooling of interests, using past experience and insight of these problems to guide and direct the work. I speak as a state hospital man; I have always felt close to this group, which after all bears the terrific responsibility incurred in handling a large number of hospital patients year in and year out, usually poorly supported with inadequate facilities and numerous other barriers. This work can be successful only under trained psychiatric leadership. Dr. Grimes has given us an interesting preliminary report. The return from the questionnaire is most gratifying. It was felt by the advisory committee that the questionnaire study should be completed in the beginning of this study of mental hospitals. No plans were laid to appraise individual hospitals. Later on, the committee advised that a complete study be made under experienced psychiatric leadership with active participation and utilization of the material now available from the Committee for Mental Hygiene and other national organizations. This plan seems to be the logical one: First, factual data regarding public and private hospitals should be obtained. Second, these data should be interpreted and classified, the required standards for mental hospitals being used. This interpretation should be made by leading representatives of psychiatry, especially by men who have had considerable state hospital experience. There are many hospital systems that are outstanding as models. These studies, which will take years, can be completed and will be of great importance to the medical profession. This liaison development between the psychiatric and medical associations will be epoch making in its medical, social and legislative aspects if all groups cooperate.

DR. H. M. DOOLITTLE, Dallas, Texas: I have been asked to represent rather unofficially the Central Neuropsychiatric Hospital Association. We are very much pleased with the fact that this kind of an investigation is being made of mental hospitals, and one reason is that when we organized our association we wanted to have some standards and we had nothing to go by. There were no standards for the private psychiatric

hospital, so we endeavored to establish some. We call them minimum requirements. They probably should be called average standards. We did not feel that we should take the finest private sanatoriums and require all of them to meet those requirements; neither did we want to put them on the lowest level. We hope the work of this committee that is being done will give us some additional standards, some additional backing, to try to elevate and standardize the small private institutions.

The Private Care of Nervous and Mental Patients

DR. G. WILSE ROBINSON, Kansas City, Mo.: Because of the demand of a considerable number of people well able to pay for hospital care and medical treatment, there have been built and equipped, at private expense, many private institutions throughout the country for the care and treatment of nervous and mental patients who desire to pay for their own treatment and hospitalization.

There are approximately, at present, 326 of these institutions, with a capacity of some 20,000 patients. I was unable to get any late figures on the number of patients admitted annually to these institutions. The latest I could get from the National Committee for Mental Hygiene were for 1922. In that year 15,678 patients were admitted and 13,105 were discharged. These institutions have increased from 225 in 1922 to 326 in 1931.

Institutions of this character are usually located either in or near a large city. They should be well equipped for the treatment of all classes of mental and nervous patients; they should be directed by men specially trained in neuropsychiatry; there should be ample grounds for the recreation and exercise of the patients; the institutions should be so built as to protect the patients who have suicidal or homicidal tendencies; they should be relatively small, so that each patient may receive the needed amount of personal attention from the physicians in attendance and also from the nurses who are caring for them.

It has been my observation that mental patients recover more quickly and more surely in a small institution, not overcrowded, where more personal attention can be given the patient by the physicians and nurses. Mental patients can receive this personal attention only in a small institution. Then, too, many patients and relatives of patients seriously object to confinement in a state institution. In the mind of the public, these institutions are still insane asylums, and this same public puts the stamp of insanity on any one who has been confined in an insane asylum, and it is difficult for the patient who has been so confined to regain a place in society and public confidence.

All mental patients may develop suicidal or homicidal tendencies. It is therefore a mistake to undertake the care and treatment of such patients in the home or in a general hospital. Mental patients do not get along well in the home, surrounded by relatives and friends. The same statement is true of care in a general hospital, where the patient cannot be properly controlled and disciplined. Control and discipline are important factors in the treatment of all mental patients. All depressed, nervous patients should be placed where they can be protected, and this cannot be done either in the home or in a general hospital.

The treatment of nervous and mental patients must be determined according to conditions. The physicians and nurses in attendance should be patient, kindly and resourceful and, above all, should be specially trained for the work.

The cost of building and equipping these private institutions has amounted to many millions of dollars. If they are to be crowded out by complete state care of the mental and nervous patients, it would mean the confiscation of many millions of dollars invested generally by physicians.

In order to maintain the private institutions, a certain charge must be made for the care of patients, which, in most instances, is reasonable. In some institutions, hospitalization, medical care and general nursing can be obtained for $35 a week; $50 a week is perhaps a fair average price. Compared with the charges made by general hospitals, wherein the patient must pay a hospital fee for all medication and surgical dressings supplied and must, in addition, pay the physician in attendance, the charge is relatively low. But the private institution cannot compete with public institutions in which a considerable part of the expense is paid by the state.

DISCUSSION

DR. FRANK P. NORBURY, Jacksonville, Ill.: In order to meet the demands for treatment and care of nervous and mental patients both from the physiologic and from the psychologic level, and considering the alliance of the biologic and social problems involved, organized institutional service is required if we are to consider the individual as a whole, in our attempts to solve his problems of life. It is true that many patients can receive extramural treatment. But even then the private clinic of a well organized institution, with a trained staff, best subserves the indications for handling the extramural case. The intramural group of cases presents the special need for hospitalization, well organized, with trained personnel and modern facilities, that can and does insure individualized treatment, which is impossible in general hospitals and obtainable only in civil state hospitals where there is no overcrowding and a large enough staff to give adequate individualized service. Such an institution gets away, as far as possible, from "mass production" methods.

DR. E. J. BRADY, Colorado Springs, Colo.: I feel that there is only one danger in the private institution, and that is that we have a tendency to commercialize the institution too much; that we want to make too much money instead of trying to do the good we can. As an owner of a private institution, I want to say that the longer I conduct that institution, the more opportunity I see to do good, to keep the stigmas, which have been suggested and spoken of this afternoon, of disgrace from some of these individuals who have money and can pay their own way instead of going to the state institutions. One of the things we all have to try to break down is the disgrace they feel is connected with the developing of sick nerves. I never could see why there is any more disgrace in having sick nerves or a sick brain than there would be in having sick lungs or sick kidneys.

DR. C. C. BURLINGAME, Hartford, Conn.: I should like to speak for the privately endowed institution. In 1892 the Hartford Retreat was established by the Connecticut State Medical Society. I think in some ways those medical men were a little further advanced than we are now. They solved a problem which I believe exists now, but we are doing nothing about it. Some men were practicing psychiatry. They had patients, and those patients were in very close intimate relationship with their physician. Today we find a sharp break between the man who is taking care of the mental patient in the first instance, that patient being outside the hospital, and the care as soon as the patient passes the hospital doors. I believe we should break up the isolation between extramural and intramural psychiatry. I think the time is coming when we are going to stop being silly about that. There is no reason in the world that I can see why a man practicing psychiatry should not take his patient into the hospital and maintain that highly desirable intimate relationship which he has established with his patients outside.

DR. G. W. MICHELL, Peoria, Ill.: I don't know what was in the mind of the education committee when it started last year on a program, but I hope that the result of Dr. Grimes's work will bring the intelligence and the strength of the American Medical Association as a helpful influence to all psychiatric institutions. Those of you who are old enough to remember back when they took hold of the college question twenty-five or thirty years ago can see the vast improvement in medical education. There is one other thing I hope the committee had in mind, and that is to educate the ordinary physician in the medical colleges in psychiatric matters. The one thing that struck me a year ago at this meeting was the fact that Dr. Ebaugh instituted two courses, I think he said, in his medical school for teaching psychiatry. There isn't any reason why any physician going through college shouldn't come out knowing as much about psychiatry as he does about obstetrics or surgery, or anything else. I say that for this reason: the 150,000 or 200,000 people in this country who are shut up in institutions because they are harmful to others or to themselves are not the only people who need psychiatric help.

(To be continued)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Decrease in Births Among Foreign Born.—There were 2,829 fewer births registered in California in 1931 than during 1930. Nearly 65 per cent of the decrease occurred among the foreign born, 1,812 fewer births being recorded. The greatest decrease (1,586) occurred among Mexicans, with a total loss of 1,017 births among white residents. There were 180 fewer Japanese births in 1931, 15 fewer Chinese births, and 31 fewer births among people of other foreign races. The total number of Mexican births in 1930 was 14,472, and, in 1931, 12,886. In 1930, Mexican births constituted 17.2 per cent of the total number of births that occurred within the state, and, in 1931, 15.8 per cent. The only increase of births among people of races other than white occurred among Negroes, among whom there were 1,159 births in 1931, as compared with 1,110 in 1930. There were 84,382 births registered in California in 1930, and 81,553 in 1931. In the former year, 77.1 per cent of all births were of white infants and, in the latter, 78.5 per cent of all births were of white infants. The decrease in Mexican births is explained by the return of large numbers of Mexicans to their home country.

Society News.—Dr. Linn J. Boyd, New York, addressed the San Francisco County Medical Society, April 12, on "Relation of Homeopathy to United Medicine," and Dr. Ira B. Bartle, San Luis Obispo, on "Actinomycosis, Particularly of the Chest."—At the meeting of the Los Angeles County Medical Association, April 7, the program included a cancer symposium in which the speakers were Drs. Lyell C. Kinney, San Diego; Charles A. Dukes, Oakland; Alson R. Kilgore, San Francisco, and William H. Sargent, Oakland.—Dr. Charles Bennett and Leo P. Samuels, Ph.D., among others, addressed the Los Angeles Obstetrical and Gynecological Society, April 12, on "Endocrine Basis for Therapy in Menstrual Disorders" and "Interpretation of Follicular Hormone Test," respectively.—Dr. Fred R. Fairchild, Woodland, addressed the Los Angeles Surgical Society, April 8, on "Lessons Taught by a Critical Review of All Appendicitis Cases Seen the Previous Five Years."—Dr. Walter B. Cannon, Boston, addressed the San Diego County Medical Society, April 12, on "Rôle of the Sympathetic System in the Control of Internal Environment."—The Alameda County Medical Association was addressed, April 18, by Drs. Carl R. Howson, Los Angeles, on "Age Group Variations in Tuberculosis"; Edward W. Hayes, Monrovia, "Diagnosis in Childhood," and Philip H. Pierson, San Francisco, "Diagnosis in Adults."

CONNECTICUT

Dr. Winternitz Awarded Dental Medal.—At a meeting of the Connecticut State Dental Association, March 30, Dr. Milton C. Winternitz, dean, Yale University School of Medicine, New Haven, was presented with the Newell Sills Jenkins Memorial Medal for meritorious service to the dental profession. The program was a cancer symposium to which the public was invited. The addresses of the evening were given by Dr. Samuel C. Harvey, professor of surgery at Yale, on "Cancer as a Public Welfare Problem," and Dr. George T. Pack, New York, on "Diagnosis and Treatment of Intra-Oral Cancer." The medal is awarded each year by the state dental association to the person who has made a notable contribution to dentistry, science or humanity. It has been awarded annually since 1922.

DISTRICT OF COLUMBIA

Conference on Popularization of Science.—A conference on the dissemination of scientific knowledge will be held, April 27, at the building of the National Academy of Sciences and the National Research Council, Washington, under the auspices of Science Service. The purpose of the conference is to consider means of making science better known and appreciated by the public as a contribution to modern civilization. Science Service is the institution for the popularization of science, organized in 1921 as a non-profit corporation with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, and the E. W. Scripps Estate and the journalistic profession. Included among the speakers will be Dr. Simon Flexner, Rockefeller Institute for Medical Research; Edwin B. Wilson, Ph.D., Harvard University School of Public Health; John C. Merriam, LL.D., of the Carnegie Institution of Washington, and Robert A. Millikan, Sc.D., California Institute of Technology.

Annual Meeting of Medical Society.—The annual session of the Medical Society of the District of Columbia will be held, May 4-5, at the society's building, under the presidency of Dr. Arthur C. Christie. Dr. Haven Emerson, New York, will address a public meeting, May 5, on "The Mutual Responsibility of the Medical Profession and the Laity in the Organization of Preventive Efforts in a Community." Included in the program will be symposiums on acute appendicitis, vascular disease and cardiac disease. Among the speakers will be Drs. Joseph F. McCarthy, New York, on "A Summary of Recent Developments in Endo-Urethral Surgery of the Prostate Gland"; William Thornwall Davis, "Modern Conception and Treatment of Convergent Squint"; Elijah W. Titus and Bernard Notes, "Gonorrhea in Female Children, with Special Reference to Newer Methods of Treatment"; Joseph B. Bogan, "Basal Anesthetics: A Brief Consideration of Their Effects and Comparative Safety"; Dr. Claude Moore, "Differential Diagnosis by X-Ray of Primary Bone Tumors," and Emanuel Libman, New York, "Coronary Thrombosis." Technical and scientific exhibits will also be held.

GEORGIA

Personal.—Dr. Joseph H. Hines, Atlanta, has been named superintendent of medical service at Grady Hospital, a recently created position.—Dr. William Nevin Adkins, Atlanta, has recently been appointed health officer of Fulton County.—The Seventh District Medical Society honored Dr. James W. Clements, Subligna, February 11, in celebration of his ninety-first birthday. Dr. Clements practiced medicine for sixty-five years in the community where he now lives.

Society News.—It has been announced that the medical societies of Cook and Lowndes counties will affiliate.—Dr. William C. Boswell, Macon, addressed the Macon Medical Society (Bibb County), March 1, on "Roentgenology as an Aid to Diagnosis and Treatment of Tuberculosis in Children."—Dr. Lewis M. Gaines read a paper on "Disturbances of Digestion and Their Relation to the Nervous System," among other speakers before the Fulton County Medical Society, March 17. Dr. Frank K. Boland, Atlanta, addressed the society, April 7, on "Acute Appendicitis in Atlanta."—The Fulton County Pediatric Society was addressed, April 14, by Dr. Joseph H. Kite, Decatur, on "Flat Feet in Children." Dr. Thomas Bolling Gay, Jr., Atlanta, presented a case report on "Malignant Disease of the Liver."—The Cobb County Medical Society was addressed, March 1, by Dr. John Calvin Weaver, Atlanta, on "Brain Lesions."

ILLINOIS

Society News.—Dr. Charles S. Williamson, Chicago, addressed the Knox County Medical Society, April 19, on "Pericarditis—the Cardiac Condition Most Frequently Overlooked."—The Will-Grundy County Medical Society was addressed, April 20, in Joliet by Dr. James T. Case, Chicago, on "Chronic Intestinal Obstruction."

State Tuberculosis Meeting.—The Illinois Tuberculosis Association will hold its annual meeting in Danville, April 25, with Dr. Charles E. Wilkinson presiding. Dr. Iago Galdston, New York, will address the session on "Looking into the Future," and Dr. Alfred Henry, president, National Tuberculosis Association, "Our Job Now." Other speakers will include M. A. Auerbach, executive secretary, Indiana Tuberculosis Association, "Place of the Lay Organization in the Health Education Program," and Dr. John R. Neal, Springfield, president-elect, Illinois State Medical Society, "The Medical Society's Responsibility in the Field of Health Education."

Chicago

Symposium on Medical Economics.—The meeting of the Chicago Medical Society, April 27, will be sponsored by the committee on medical economics. The speakers will be Dr. Arthur T. Holbrook, Milwaukee, on "Economic Depression in the Practice of Medicine"; Nathan Sinai, D.P.H., Ann Arbor, Mich., "Health Insurance"; Dr. Rosco G. Leland, director, Bureau of Economics of the American Medical Association, "Current Trends in Medical Practice," and Dr. Morris Fishbein, editor of THE JOURNAL, "Medical Advertising and Medical Publicity."

Hospital Associations Hold Joint Meeting.—The Illinois, Indiana and Wisconsin hospital associations will meet jointly, April 27, at the Hotel Sherman. Among the speakers will be Albert Stump, Indianapolis, on "Poor Relief Laws of Indiana"; J. Dewey Lutes, Chicago, Dr. Edward T. Thompson, Indianapolis, and Dr. Robin C. Buerki, Madison, "Report of Economic Surveys of Hospital Situation—Illinois, Indiana, and Wisconsin"; Dr. Fred G. Carter, St. Paul, "Should General Hospitals Extend Their Services to Mental, Tuberculosis and Contagious Patients?" Paul H. Fesler, Chicago, president, American Hospital Association, will speak at the banquet on "What the American Hospital Association Is Doing for You." Mr. Charles A. Wordell, president of the Chicago Hospital Association, will be toastmaster.

Letter to Public Health Institute.—Suggested changes in the method of advertising the services of the Public Health Institute were contained in a recent letter from the Chicago Medical Society to the institute. The letter calls attention to the principles laid down in the code of ethics of the American Medical Association, under which an ethical individual or institution in medicine may be defined, and continues, "If the Public Health Institute or any similar organization desires to qualify as an ethical unit, it must conform in its advertising and otherwise to the provisions of the code. The code states plainly (chap. II, art. I, sec. 4) that 'solicitation of patients by physicians as individuals or collectively in groups, by whatsoever name these may be called, or by institutions or organizations, whether by circulars or advertisements, or by personal communications, is unprofessional. This does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class, if any, of patients accommodated.'" It was also stated in the letter that, since the institute claims to be conducted on a "not-for-profit" basis, the medical society feels that the unethical advertising could be readily abandoned without injury to the institute and with definite relief to the public. The suggested form of advertising, given as an example, contains the proper name of the institute, the specialty to which it limits its practice, and the addresses of departments for treatment of men and women.

INDIANA

Society News.—The LaPorte County Medical Society was addressed at Michigan City, March 17, by Dr. Albert E. Bulson, Fort Wayne, on "Diseases of the Eye as Seen by the General Practitioner."——Dr. John C. Bradfield, Logansport, and T. L. Babcock, D.D.S., addressed the Cass County Medical Society at Logansport, March 17, on "Medical and Surgical Diseases of Oral Cavity" and "Oral Diagnosis Aided by Cooperation."——Dr. Raymond A. Voisinet, Union City, talked on orthopedic treatment of the hand and wrist with special reference to Colles's fracture before the Randolph County Medical Society at Winchester, March 14.——Dr. Floyd L. Grandstaff, Preble, addressed the Adams County Medical Society, March 11, at Decatur, on "X-Ray and Radium Therapy."——The Delaware-Blackford County Medical Society was addressed at Muncie, March 15, by Dr. Arthur C. Rettig, Muncie, on "Diphtheria Prevention."——The Indianapolis Medical Society was addressed, March 29, by Drs. Oscar N. Torian and Matthew Winters on "Anterior Poliomyelitis in Preparalytic Stage" with discussion of treatment and report of seven suspected cases. Dr. George T. Palmer, Springfield, Ill., addressed a joint meeting of the society and the Indiana State Tuberculosis Association, April 19, on "Medical Aspects of the Period of Business Depression."——Dr. John S. Coulter, Chicago, addressed the Tippecanoe County Medical Society at Lafayette, April 14, on "Treatment of Arthritis."

KANSAS

State Medical Meeting at Kansas City.—The seventy-fourth annual meeting of the Kansas Medical Society will be held in Kansas City, May 3-5, at the Soldiers and Sailors Memorial Building, under the presidency of Dr. Paul S. Mitchell, Iola, whose address will be "Importance of Recognizing the Human Aspects in Medical Organization." The Wyandotte County Medical Society will act as host. The speakers, May 4, Guest Day, will be Drs. William W. Bauer, American Medical Association, Chicago, on "The Bureau of Health and Public Instruction"; Harrison H. Shoulders, Nashville, Tenn., "Legislative Activities"; Harvey J. Howard, St. Louis, "Offensive and Defensive Factors Associated with Infections of a Mucous Membrane"; Paul A. O'Leary, Rochester, Minn., "Acne, Its Variations and Their Treatment"; Ralph A. Kinsella, St. Louis, "Rheumatism," and Clifford G. Grulee, Chicago, "Diagnosis and Treatment of Lobar Pneumonia in Infants and Young Children." Dr. Bauer will also address a public meeting, May 5, on "Individual Health Improvement." Kansas physicians on the program will include Drs. Carl F. Nelson, Lawrence, on "Is the Profession of Medicine Committing Suicide?"; Lewis G. Allen, Kansas City, "The Physician's Testimony"; Ray A. West, Wichita, "A New Modification of the Aschheim-Zondek Test for Pregnancy, with a Review of the Literature," and Charles T. Moran, Arkansas City, "Allergy and Its Relations to the Rhinologist." The annual banquet for members of the society, wives and friends will be held Wednesday evening, and an all-day tournament will be held Monday, May 2, at Victor Hills Golf Course; prizes will be awarded. A complimentary luncheon will be given to the secretaries of the county societies, Tuesday.

LOUISIANA

Society News.—Dr. Clarence M. Hincks, director, National Committee for Mental Hygiene, New York, gave three lectures on mental hygiene, April 11, in New Orleans. The meetings were under the auspices of the Louisiana Society for Mental Hygiene.——Speakers before the Orleans Parish Medical Society, April 11, were Drs. George B. Collier on "Tonsillectomy by Fractional Electrocoagulation: Advantages and Disadvantages of Diathermy in Otolaryngology," and Carlo J. Tripoli, Emmerich Haam and Edward B. Lehman, "Roentgenographic Visualization of the Liver and Spleen as an Aid in the Differential Diagnosis of Tumors of the Abdomen."

Cancer Committee Organized.—A state cancer committee was organized, February 22, by Dr. Sidney C. Barrow, Shreveport, in cooperation with the American Society for the Control of Cancer. Dr. John A. Lanford, New Orleans, is chairman of the committee. In addition to Dr. Barrow, other members are Drs. Jack T. Cappel, Alexandria; Dempsey C. Iles, Lake Charles; Alton Ochsner and Arthur Vidrine, New Orleans; Lester J. Williams, Baton Rouge; James B. Vaughan, Monroe, and Edgar L. Sanderson, Shreveport. A campaign limited to the physicians of the state for the present has been outlined, it was reported, the plans for which are awaiting approval of the state medical association, which meets in New Orleans, May 9-10.

MARYLAND

Industries to Cooperate in Diphtheria Campaign.—More than one hundred industries have responded favorably to requests from the Baltimore health department for cooperation in an antidiphtheria campaign, to be started May 1. These industries have agreed to place in the pay envelops of employees printed slips to be supplied by the health department urging the prevention of diphtheria. It was said that an equal number of physicians in private practice have promised to bring the campaign to the attention of the families under their professional care and to urge the immunization of children with toxoid or toxin-antitoxin, which may be purchased or obtained without charge from the health department. School children will assist by distributing literature bearing on the campaign.

Dr. Marshall Succeeds Dr. Abel at Johns Hopkins.—Dr. Eli Kennerly Marshall, Jr., professor of physiology in Johns Hopkins University School of Medicine since 1921, has been appointed professor of pharmacology and experimental therapeutics in that institution to succeed Dr. John J. Abel, resigned. During Dr. Abel's incumbency the position was known as the professorship of pharmacology. Dr. Abel's resignation will become effective in June. Dr. Marshall received the degree of doctor of philosophy in chemistry at Johns Hopkins in 1911, and his medical degree in 1917. He also studied in Germany. From 1911 to 1914 he was assistant and associate in physiologic chemistry at Johns Hopkins and associate professor of pharmacology, 1914-1919. He was professor of pharmacology at Washington University, St. Louis, from 1919 to 1921, returning in the latter year to Johns Hopkins.

MASSACHUSETTS

Dr. Keenan Appointed Director of Hygiene.—Dr. James A. Keenan, Boston, has been appointed director of the department of school hygiene of Boston to succeed the late Dr. John A. Ceconi. Dr. Solomon H. Rubin has been acting director of the department since Dr. Ceconi's death, Sept. 21, 1930.

Dr. Pick to Give Dunham Lectures.—Dr. Ludwig Pick, professor of pathology, University of Berlin, and director of the Pathological-Anatomical Institute, Municipal Hospital, Friedrichshain, Berlin, will deliver the Edward K. Dunham Lectures for the Promotion of the Medical Sciences, May 3 and 5, at Harvard University Medical School. "A Classifica-

tion of the Diseases of Lipoid Metabolism and Gaucher's Disease" will be Dr. Pick's subject, May 3, and "Niemann-Pick's Disease and Other Forms of So-Called Xanthomatosis" will be his topic, May 5. The Edward K. Dunham Lectureship was founded in 1923 in memory of a physician of that name.

MINNESOTA

Dr. Singer to Lecture at University. — Dr. Charles Singer, professor of the history of medicine, University of London, and visiting professor of the history of science, University of California, will lecture at the University of Minnesota, April 26. The subjects of the lectures are "Anglo-Saxon Magic and Medicine" and "Ancient Medicine." Dr. Singer will be the guest of the graduate school and of the local chapter of Alpha Omega Alpha.

Jailed for Violation of Suspended Sentence.—Robert McGraw, a Negro, was arrested, April 5, and confined in the McLeod County Jail to serve a one year suspended sentence, which he had violated. McGraw pleaded guilty, June 12, 1931, to two charges of practicing healing without a basic science certificate and was fined $225 and costs on the first charge and given a suspended sentence of one year in the county jail on the second charge. A condition of the suspended sentence required McGraw to refrain from practicing healing in Minnesota until he was properly licensed. The state board of medical examiners discovered that in the fall of 1931 McGraw came to Lyon County, Minn., and extracted $250 in cash to cure an alleged case of cancer. At that time he was located in Sioux City, Iowa. About March 1, 1932, he moved back into Todd County, Minn. Following an investigation by the medical board, Judge Tifft, who tried McGraw last year, revoked the suspension of sentence, April 2, and ordered him committed to the McLeod County Jail to serve the one year term (THE JOURNAL, July 4, 1931, p. 37).

NEW JERSEY

Society News. — Mr. Robert Peacock, assistant attorney general of New Jersey, addressed the Essex County Medical Society, Newark, March 10, on "The Doctor and the Law."——Dr. George T. Pack, New York, addressed the Ridgewood Medical Society, February 26, on "Diagnosis and Treatment in Mammary Cancer."——Drs. William S. Wheeling, Windber, Pa., and Charles R. Austrian, Baltimore, addressed the Atlantic County Medical Society, Atlantic City, April 8, on "Experiences with Five Hundred Cases of Goiter with Special Reference to Thyrotoxicosis," and "Acute Thrombotic Occlusion of the Coronary Arteries," respectively.——Dr. Russell L. Cecil, New York, addressed the Academy of Medicine of Northern New Jersey, February 9, on "A New Point of View on Rheumatic Diseases."——At a joint meeting of the Hudson County Medical Society and the Hudson County Bar Association, Jersey City, April 5, a symposium on "Criminals in the Making" was presented by Jane M. Hoey of the Welfare Council, New York; Dr. Francis J. O'Brien, assistant director, bureau of child guidance, New York City Board of Education, and Dr. Walter N. Thayer, Albany, New York state commissioner of correction.——Dr. Allen O. Whipple, New York, addressed the Bergen County Medical Society, Hackensack, April 12, on surgical problems.

NEW YORK

State Health Commission Makes Final Report.—The New York State Health Commission, appointed by Gov. Franklin D. Roosevelt in 1930 to study the application of the present public health law, has published its final report, entitled "Public Health in New York State." The principal features of the report were embodied in a preliminary report issued early in 1931 (THE JOURNAL, April 4, 1931, p. 1153, and April 11, p. 1239). They included recommendations for reorganization of state health activities on a county basis, control of venereal disease as a public health problem, enlargement of the state's facilities for care of the tuberculous, creation of state agencies for cancer control and rehabilitation of cripples and a state program of maternal and infant hygiene. Other suggestions related to industrial hygiene, public health nursing and sanitation. The program for care of the tuberculous was enacted into law by the 1931 legislature. This is the first comprehensive health survey in the state since 1913, when a similar commission headed by Dr. Hermann M. Biggs made a report that led to fundamental changes in the public health law. Marked inequality in health services was found in different parts of the state, a situation attributed to lack of effective local machinery, lack of understanding of preventive measures on the part of citizens, and inability of many citizens to procure needed care. Governor Roosevelt, in a foreword to the report, said, "The report opens the way for a new health program during the coming years, which if well executed, should bring to New York State even greater advances than the results achieved during recent years of which we are so proud."

New York City

Exhibit of Physicians' Writings.—An exhibition of fiction and dramatic works by physicians opened, March 15, in the library of the New York Academy of Medicine and will continue till May 1. The collection has been assembled over a period of years through the efforts of Dr. Thomas Archibald Malloch, librarian of the academy, and Dr. Dudley D. Roberts, who gave his private collection to the academy. Nearly 200 authors are represented in the exhibit. Many of the books are now out of print. It is planned eventually to publish complete bibliographies of the nonmedical writings of physicians. In the collection are included world classics by Rabelais, Goldsmith, Smollett, Oliver Wendell Holmes, Arthur Conan Doyle and Eugene Sue, as well as modern writers, such as Somerset Maugham, Warwick Deeping, S. Weir Mitchell and Axel Munthe.

Society News.—Dr. William Bierman addressed the New York Physical Therapy Society, April 6, on "Radiothermy."——Drs. Herbert Willy Meyer and August S. A. Thommen addressed the Harlem Medical Association, April 6, on "Surgical Principles for Treatment of Cancer of the Head and Neck" and "Food Allergy: Its Diagnosis and Management," respectively.——The fiftieth anniversary of Koch's discovery of the tubercle bacillus was celebrated at the Rockefeller Institute for Medical Research at a meeting, March 24, with Drs. Theobald Smith, Princeton, N. J., Karl Landsteiner and Simon Flexner as the speakers.——Dr. Harold Neuhof delivered the Friday afternoon lecture of the Medical Society of the County of Queens, April 1, on "Manifestations and Diagnosis of Surgical Septicemia and Treatment of Suppurative Foci."——Dr. Henry W. Cave addressed the New York Surgical Society, April 13, on "Tumors of the Small Intestine."——At a meeting of the Society of Medical Jurisprudence, April 11, Dr. Richard Kovacs discussed "Accidental Injuries in Office Practice," and Dr. Lyman W. Crossman made an address entitled "The Doctor Is Worthy of His Hire."

OHIO

Society News. — Dr. Clarence S. Ramsey, Springfield, addressed the Greene County Medical Society, Xenia, March 4, on "Control of Pain During Parturition."——Dr. Russell L. Haden, Cleveland, made the principal address at a meeting of the Portage County Medical Society, Kent, March 3, on "Newer Conceptions of Anemia."——Dr. Marion A. Blankenhorn, Cleveland, addressed the Stark County Medical Society, Canton, March 8, on "Hospital Treatment of Lobar Pneumonia."——Dr. James M. Pierce, Cincinnati, will address the Montgomery County Medical Society, Dayton, May 6, on "The Hygiene of Pregnancy."——Dr. Russell L. Haden, Cleveland, discussed chronic arthritis before the Summit County Medical Society, Akron, April 5.——Dr. Curtis C. Mechling, Pittsburgh, addressed the Belmont County Medical Society, April 7, on "Diagnosis and Treatment of Acute Anorectal Diseases."

State Medical Meeting at Dayton. — The eighty-sixth annual meeting of the Ohio State Medical Association will be held in Dayton, May 3-4, under the presidency of Dr. Daniel C. Houser, Urbana. Headquarters will be at the Dayton-Biltmore Hotel. At a general session, Wednesday afternoon, May 4, the medical schools of the University of Cincinnati, Cincinnati, Ohio State University, Columbus, and Western Reserve University, Cleveland, will present special programs. Drs. Frank E. Stevenson, Stanley E. Dorst and Max M. Zinninger, Cincinnati, will speak on scarlet fever antitoxin, autogenous vaccines and acute gallbladder disease, respectively. Drs. George I. Nelson, Ernest Scott and Charles A. Doan, Columbus, will present a symposium on deficiency diseases of the blood, and Dr. Henry J. Gerstenberger, Cleveland, will discuss therapeutic lamps. Among speakers who will address sections are Drs. Lee Wallace Dean, St. Louis, on "Relationship Between Infections of the Upper Respiratory Tract and Pediatric Conditions from the Laryngological Viewpoint"; Harold N. Cole, Cleveland, "Hypersusceptibility in Eczema Dermatitis—Its Relation to Internal Medicine"; William E. Lower and William J. Engel, Cleveland, "Transurethral Resection of the Prostate," and Walter M. Simpson, Dayton, "Recent Advances in Tularemia." The annual banquet and president's reception will be held, Tuesday evening, May 3, at the Dayton-Biltmore. Clinics will be held at several Dayton hospitals as an additional feature, May 2.

PENNSYLVANIA

Society News.—Drs. Stanley Crawford and Kenneth M. Day addressed the Pittsburgh Pediatric Society, April 15, on "Juvenile Acrodynia" and "Tonsillectomies," respectively.—— Dr. Joseph McIver, Philadelphia, addressed the Northampton County Medical Society, Bethlehem, April 15, on "Sequelae of Head Injuries."—— Dr. Russell L. Cecil, New York, addressed the Main Line Branch of the Montgomery County Medical Society, Haverford, April 11, on "Pneumonia and Its Specific Treatment."

Philadelphia

Lectures at Jefferson Medical College.—Dr. Lewellys F. Barker, professor emeritus of medicine, Johns Hopkins University School of Medicine, Baltimore, delivered the annual Alpha Omega Alpha lecture at Jefferson Medical College, March 4, on "Medical and Other Conditions in Soviet Russia." The J. Earl Thomas Physiology Society at the college presented as guest lecturer, March 10, R. L. Stehle, Ph.D., professor of pharmacology, McGill University, Montreal, who spoke on "Vascular and Cardiac Actions of Pituitary Extract." Dr. Charles M. M. Gruber, associate professor of pharmacology, Washington University School of Medicine, St. Louis, delivered a lecture under the auspices of the Elmer H. Funk Therapeutic Society, March 16, on "The Action of Drugs on the Gastro-Intestinal Tract." Dr. Anthony Bassler, New York, addressed students of Jefferson Medical College and Hahnemann Medical College, March 23, on "Physiology of the Pancreas."

Society News.—The section on medical history of the College of Physicians of Philadelphia presented a special program, April 11, commemorating the centenary of the death of Goethe. Among the speakers were Drs. Edward A. Schumann, on "Goethe as a Naturalist," and Burton Chance, "Goethe and His Theory of Colors."——The Philadelphia Heart Association held its tenth anniversary meeting, April 13. Drs. William D. Stroud and John H. Wyckoff, Jr., New York, reviewed recent advances in the campaign against heart disease and Dr. Horatio C. Wood, Jr., spoke on diet and health.——Arthur I. Kendall, Ph.D., Chicago, gave the annual conversational lecture of the Pathological Society of Philadelphia, April 14, on filtrable bacteria.—— A Philadelphia chapter of the Pan American Medical Association was formed, April 8, with twenty-four charter members. Dr. Chevalier Jackson is president and Dr. Chevalier L. Jackson, secretary.——The Woman's Auxiliary of the Philadelphia County Medical Society sponsored an all-day health institute, April 12, at the society's building. Dr. Jay F. Schamberg, among other speakers, made an address on "What the Public Thinks of Present-Day Medicine."

WASHINGTON

Hospital News.—The cornerstone of a new $2,000,000 U. S. Marine Hospital was laid in Seattle in February. It will serve merchant seamen, men in the U. S. Coast Guard and Lighthouse service, federal compensation cases, and beneficiaries of the Veterans' Administration.——Ritzville General Hospital has been reopened.

Society News.—Drs. John C. Lyman and Carl J. Johannesson, Walla Walla, addressed the Chelan County Medical Society, Wenatchee, April 6, on "Diagnosis and Treatment of Pancreatitis" and "Oral Cholecystography," respectively.—— H. E. Foster, assistant attorney general, Olympia, among others, addressed the Yakima County Medical Society at Yakima, in February, on the medical practice act of Washington.—— Dr. Isidor S. Ravdin, Philadelphia, will address the Tacoma Surgical Club on "Surgery of the Future" at the annual banquet, May 7.——Drs. George W. Swift and Edwin A. Nixon, Seattle, spoke on injuries to the head, and Dr. Jay I. Durand, Seattle, on poliomyelitis, before the Skagit County Medical Society at Sedro Woolley, March 28.

WEST VIRGINIA

Society News.—Dr. Theodore Diller, Pittsburgh, addressed the Ohio County Medical Society, Wheeling, April 1, on "Human Credulity as Illustrated by Consideration of Witchcraft."—— Dr. Benjamin I. Golden, Elkins, addressed the Kanawha County Medical Society, Charleston, March 8, on "Interrelation of the Gallbladder, Appendix and Intestine in Abdominal Conditions."——Drs. Archer A. Wilson and Russel Kessel, Charleston, addressed the Logan County Medical Society, Logan, March 16, on "Diagnosis and Treatment of Acute Brain Injuries" and "Workmen's Compensation and Its Relationship to the Industrial Physician," respectively.

Rulings of Public Health Council.—Reports of admissions and discharges of patients from the several tuberculosis sanatoriums in the state will be sent to the health officers of the counties or municipalities in which these patients are received or to which they are returned, according to a ruling passed by the Public Health Council at a recent meeting. The health officer is then to investigate and report on the history of the patient, living conditions, medical service, and examination of persons occupying the same house. It is believed that this information will aid the state health department in acquiring a more accurate knowledge of the prevalence of tuberculosis and thereby help reduce the incidence. The council also entered an order to the effect that health officers of counties and municipalities must be bona fide residents of the state at the time of their appointment.

GENERAL

Study of Noise Reduction.—A survey on noise reduction and vibration is now being conducted by a group within the American Electric Railway Association known as the President's Conference Committee. The report of this committee will be presented in about a year. A committee by tests made in 1931, confirmed its report of several years ago that a cushioning of rails in track construction will reduce the total noise produced by street cars by at least 25 per cent.

May Day Objectives.—May Day-National Child Health Day will be observed this year with certain objectives in keeping with the demands of the economic situation. Among the purposes named by the committee are that each child (1) may be sheltered in his own home and share secure family life, (2) may have the essential food elements in his diet, (3) may have an adequate amount of clean and safe milk, and (4) may have plenty of sunshine, sleep, health and recreation. This year's observance is under the auspices of the State and Provincial Health Authorities of North America with the cooperation of the American Child Health Association.

Climatological and Clinical Association.—The forty-ninth annual meeting of the American Climatological and Clinical Association will be held at the Seaview Golf Club, Absecon, N. J., near Atlantic City, May 5-7, under the presidency of Dr. Louis Hamman, Baltimore. Among speakers at the scientific sessions will be Drs. George R. Minot, Boston, on "Importance of the Treatment of Pernicious Anemia on a Quantitative Basis"; Maurice Fremont-Smith, Boston, "Relationship Between Emotional Tension and Organic Disease"; James Burns Amberson, Jr., New York, "The Uses and Dangers of Lipiodol in Visualization of the Lower Respiratory Tract," and Paul D. White, Boston, "Clinical Observations on Adhesive Pericarditis." Two afternoons will be devoted to round table discussions: Thursday, on diseases of the heart, under the chairmanship of Joseph H. Pratt, Boston; Friday, on diseases of the lungs, under the chairmanship of Dr. Lawrason Brown, Saranac Lake.

Relief for the Deaf and Blind.—Three voluntary agencies have combined to promote a program of relief for persons who are both deaf and blind—the American Foundation for the Blind, the American Association to Promote the Teaching of Speech to the Deaf and the American Federation of Organizations for the Hard of Hearing. As a result of a study of this double handicap, plans have been worked out for the participation of each organization in its own field. A legislative campaign to provide proper care and training for the deaf-blind will be undertaken by the Foundation for the Blind. Individual case work will be carried on by the federation for the hard of hearing to provide this class of the handicapped training in methods of communication, lessons in handicraft or trades, general education, help in finding markets for their work, reading matter in braille, hearing aids when usable and medical or financial assistance. The association concerned with teaching the deaf will analyze and classify data and keep records at its headquarters, the Volta Bureau, Washington, D. C.

Medical Bills in Congress.—*Changes in Status:* A subcommittee of the Senate Committee on Military Affairs concluded hearings, April 14, on S. 3759, proposing to amend the Disabled Emergency Officers' Retirement Act to provide, among other things, that emergency officers of the World War who are suffering from disabilities *presumptively* of service origin shall not be entitled to retirement under the act. A subcommittee of the House Committee on Military Affairs held hearings, April 13, 14 and 15, on H. J. Res. 355, providing, among other things, for the repeal of the Disabled Emergency Officers' Retirement Act. A subcommittee of the Senate Committee on the Judiciary held hearings, April 14 and

15, on the bills relating to intoxicating liquor pending before the committee. Hearings will be resumed, April 19. A special hearing on the medicinal liquor bills pending before the committee was given, April 7. *Bills Introduced:* S. 4395, by Senator Tydings (by request), Maryland, to provide medical services after retirement on annuity, to former employees of the United States disabled by injuries sustained in the performance of their duties. H. J. Res. 361, by Representative Parsons, Illinois, to authorize the Surgeon General of the United States Public Health Service to make a survey of the existing facilities for the protection of the public health in the care and treatment of leprous persons in the territory of Hawaii. H. R. 10865, by Representative Johnson, Missouri, to amend the World War Veterans' Act to require sixty instead of ninety days' service during the World War to entitle a veteran to a pension for disability incurred in civil life.

Bequests and Donations.—The following bequests and donations have recently been announced:

Presbyterian and Bellevue hospitals, New York, bequests of one sixth each of an estate estimated at $8,000,000, by the will of the late Mrs. Agnes R. Clarke.

American Society for the Control of Cancer, New York, $50,000, and Brooklyn Eye and Ear Hospital, $25,000 by the will of William H. Nichols.

Lenox Hill Hospital, New York, $10,000 by the will of the late John Christian Glaser Hupfel.

Mount Sinai Hospital, $7,500; Monmouth Memorial Hospital, Long Branch, N. J., Stony Wold and Montefiore hospitals, New York, $3,000 in the will of Mrs. Alice A. Kohler.

Mercy Hospital, Burlington, Iowa, $300 to furnish a room exclusively for benefit of Negroes, and $10,000 for its upkeep and for care of patients when necessary, by the will of the late Maud Rowan Starr of Davenport and Middlebury, Vt.

St. Mark's Hospital, Salt Lake City, Utah, $2,400 by the will of the late Dr. Francis S. Bascom.

St. Christopher's Hospital for Children, Temple University Hospital and Stetson Hospital, all of Philadelphia, $1,000 each by the will of Gustave Rumpf.

Bryn Mawr Hospital, Bryn Mawr, and Memorial Hospital, Philadelphia, $1,000 each; Montgomery Hospital, Norristown, Pa., $2,000 outright and $50,000 to finance a children's ward when a new hospital is built, by the will of John Hoffman, Jr.

Western State Hospital, Bolivar, Tenn., $3,000 by the will of Samuel Newberger, New York.

Hospital of the Woman's Medical College, Philadelphia, $5,000 by the will of Mrs. Rosa Rynning, Ocean Grove, N. J., and $10,000 by the will of George S. Wetherell in memory of his mother, Mary S. Wetherell, for many years a trustee of the hospital.

Presbyterian Hospital, New York, a residuary legacy of more than $600,000 by the will of the late Franklin Ford.

Mount Sinai Hospital, New York, $20,000 by the will of Emanuel Van Raalte.

Lenox Hill and Mount Sinai hospitals and the United Hospital Fund, $10,000 each by the will of Selma Ross.

Jefferson Medical College Hospital, Philadelphia, $5,000 by the will of the late Alfred Wetherill Hansell.

The late Dr. Charles Mortimer Montgomery bequeathed $500 to the Philadelphia County Medical Society for its physicians' aid fund; about $1,500 is to be divided between the Philadelphia College of Physicians and the Pennsylvania Hospital and 51 per cent of the $15,000 estate will go to the University of Pennsylvania for medical research after the death of Dr. Montgomery's sisters.

Hale Hospital, Haverhill, Mass., $1,000 by the will of Lillian J. Cook.

Morristown Memorial Hospital, Morristown, N. J., $10,000 by the will of the late Robert H. McCurdy.

Children's Free Hospital and Kosair Crippled Children's Hospital, Louisville, Ky., will eventually receive half of the $300,000 estate of the late Edward Anderson Hewett.

Children's Mercy Hospital, Kansas City, Mo., $10,000 by the will of Mrs. P. A. Seitz.

New England Deaconess Hospital, Boston, two bequests of $10,000 each by the will of Mrs. Edith W. Gallagher. One gift is to be used for the benefit of persons suffering from diabetes, the other for those afflicted with cancer.

Presbyterian Hospital, New York, $5,000 by the will of the late Louis Gimbel.

Mount Sinai Hospital, New York, $10,000 by the will of the late Mrs. Joel E. Hyams, to establish a cancer research fund.

Christ Hospital, Jersey City, $25,000 by the will of Mrs. Philipine H. Hazeltine.

New York Post-Graduate Medical School and Hospital, Home for Incurables, New York, each $30,000, and Woman's Hospital and Presbyterian Hospital to share in the residuary estate, by the will of the late William Colgate.

LATIN AMERICA

Yellow Fever in Bolivia.—The New York *Times* reported, April 10, that yellow fever had developed in eastern Bolivia and that a number of deaths had occurred in Santa Cruz. It was said that the government was sending physicians by airplane to the affected area.

CORRECTION

Electrosurgery.—In THE JOURNAL, February 20, in the article by Drs. Howard A. Kelly and Grant E. Ward the authors emphasized Dr. Clark's contributions. Through oversight, no specific mention was made to the work of Dr. George A. Wyeth in developing the valuable cutting current.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 26, 1932.

The Value of Tuberculin Tests

The Medical Research Council has issued a report by Dr. P. D'Arcy Hart on the value of tuberculin tests with special reference to the Mantoux intracutaneous test. He concludes that the test is chiefly of value when negative. All that a positive result indicates is either a past or a present infection with the tubercle bacillus. A clear distinction must be drawn between tuberculous infection and tuberculous disease. More than 90 per cent of the adult population has at some time been infected with the tubercle bacillus and overcome the infection without developing tuberculous disease. All such persons give a positive Mantoux test. Up to the age of 2 years the majority of children give a negative test and have therefore not as yet been infected. If such children come in contact with persons suffering from tuberculosis they are apt to develop a severe and often fatal form of the disease. Hence the high mortality in children up to the age of 2 years. From the age of 2 to 12 years the test becomes positive in an increasing proportion of healthy children, indicating that they have been infected but have overcome the infection without acquiring the disease. In adult life nearly all persons give a positive result.

PRACTICAL CONCLUSIONS

1. All children up to the age of 2 years who give a negative test should be segregated from persons suffering from tuberculous disease, because they are liable to develop a severe and even fatal form of the disease if they are not.

2. A negative test between the ages of 2 and 12 years indicates that any symptoms from which the child is suffering are not due to tuberculosis.

3. The value of the test in diagnosing tuberculosis in adults is nil, as the vast majority of healthy adults give a positive reaction.

The Use of Gloves in Industry

During a recent visit to Canada, Sir Kenneth Goadby, specialist medical referee for industrial diseases, was interested to observe the general use of gloves in many occupations. The engineers and stokers on the steamers, railway employees, scavengers, road makers, and even threshers and reapers on the prairies wore gloves. In England they are not worn during industrial work, but Sir Kenneth thinks that such protection for the hands would reduce the risk of industrial dermatitis—a condition that is increasing year by year, although other industrial diseases, such as lead poisoning, are diminishing, owing to preventive measures. Most of the dermatitis is caused by handling such apparently innocuous substances as sugar or flour in the baking and allied industries, but other trades, such as dyeing, french polishing, building and laundering, contribute their quota. Sir Kenneth considers that the use of gloves would rapidly diminish, if not entirely prevent, industrial dermatitis. The objection that gloves obstruct the nimbleness of the fingers cannot, he says, be maintained. Gloves are used by surgeons in performing the most delicate operations, and heavy gloves are commonly used in the electrical industry. The increased cost would soon be met by decreased compensation charges.

New Headquarters of Royal Society of Tropical Medicine

Manson House, the new headquarters of the Royal Society of Tropical Medicine, has been opened by the Prince of Wales. Every institute of note dealing with tropical medicine and nearly every country was represented. The society has more

than 1,700 on its roll. The prince referred to the importance of tropical disease to the British Empire and to the progress in its control made in the last thirty years. The great pioneer investigator was Patrick Manson, after whom the home of the society was fittingly named. He was the first to associate experimentally a blood-sucking insect with the transmission of human disease, and he inspired Ross to carry out his epoch-making investigations, which led to the discovery that the anopheles mosquito was the carrier of malaria. He was also the first to realize the need for schools where physicians, destined to work in the tropics, could be trained for their work. He was in fact the father of tropical medicine, and the fruits of his genius were especially exemplified in enabling the Panama Canal to be constructed in one of the most unhealthful regions of the world. With the help of that far-sighted statesman Joseph Chamberlain, he founded the School of Tropical Medicine in London.

Sir Austen Chamberlain recalled the horror with which his father in his early days at the colonial office learned the heavy toll of life taken by tropical diseases among the young men whom it was his duty to appoint to the colonial service. In 1896 the average death rate per thousand in our tropical possessions was 100, but today it was between 8 and 9.

A Handbook on Marriage

As many troubles arise in marriage that could have been prevented by fuller knowledge, the British Social Hygiene Council has engaged a committee of experts to prepare a handbook on marriage. Some of these troubles could be dealt with by a lay person with special experience of marriage problems, but others are of a definitely medical nature, which, if brought to light at an early stage, could be promptly treated by the physician. Many enter marriage with so little knowledge of its physiology that their future happiness is imperiled, for until recently the sex education of children has received little attention. But, as in many cases a personal consultation on an individual problem is necessary, the council has gone further and established a personal problems bureau. This will be run on a self-supporting basis. Consultations will be by interview and by letter. For the former the fee will be $10 and for the latter $5. In cases requiring medical assistance, a list of authorities in the special field will be given to the client for submission to "her medical adviser."

Financing Hospitals by Sweepstakes

The draw which has just taken place for the Irish Hospitals Trust sweepstake has been more successful than ever in obtaining money. The proceeds from the sale of tickets amounted to $16,800,000, which left, after the prize fund had been provided for, more than $4,000,000 for distribution among fifty-one Irish hospitals, $500,000 more than was obtained at the last draw six months ago. As usual, the money came from all over the world and most of it from outside Ireland. The scheme has proved so successful that it is proposed to endow the hospitals, so that the drain on public and private finance will be saved for all time. For this purpose, $60,000,000 would be required, of which $15,000,000 has been obtained. But desires are expressed to go further. A short time ago an Irish newspaper asked sarcastically why the expense of Irish public health should not be similarly defrayed, since Irish hospitals had become parasitic on the gambling spirit of the world. This idea has taken root. In welcoming the world's press to the draw, the lord mayor of Dublin expressed the hope that the Hospitals Trust would assist with the badly needed slum clearing and housing of Dublin. Dr. Henry Moore, professor of medicine in University College, Dublin, repeated in the *Irish Times* a suggestion made by him a year ago. Because of the lack of provision for medical research in Ireland, he suggests that a small percentage of the fruits of the sweepstakes might be earmarked for this purpose. A capital sum of, say, $1,000,000 would be adequate for the financing of medical research and could be quickly accumulated from such a percentage.

Spahlinger's Omission

As reported in THE JOURNAL, March 5, page 828, Spahlinger, after years of secrecy, has changed his tactics and at a meeting held in London stated how his vaccines are prepared. But in a letter to the *Lancet* Sir Thomas Horder has pointed out an important omission from the revelations. Spahlinger said nothing concerning his tubercle serum and its formula. Yet it is on this preparation that he has for the last twenty years mainly based his claim to cure tuberculosis. And it is on this substance that his reputation with the public and a few of the less critical members of the medical profession rests. Sir Thomas also recalls that many generous offers were made to help Spahlinger finance his remedies. Five years ago, when his friends complained that his benevolent work was being starved by lack of funds, the *Daily Express* offered him the handsome sum of $50,000 to further his researches on condition that he would give facilities to a small medical committee to examine his methods, but he refused.

PARIS

(From Our Regular Correspondent)

March 2, 1932.

Changes in the Medical Curriculum

The question of changes in the medical curriculum was brought up last year, and a ministerial inquiry was instituted in all the faculties of medicine to ascertain their views. The matter is not entirely settled, but an important point has been decided. The examinations imposed on students have consisted heretofore of oral and practical tests. Henceforth, at the end of the first and also of the second year of study, all the students will turn in, without any name, but only an identifying character, a written paper, the relative merits of which will be determined by a committee of professors. The test will be eliminative; that is to say, in case of failure, the student will not be admitted to the oral tests but will be demoted to the class below. The questions for these tests will be the same throughout France and will be forwarded, the day before the examination, in a communication from the minister, to the deans of all the faculties. The examination will consist of three questions and will be based, at the end of the first year, on anatomy, embryology and histology, and, at the end of the second year, on physiology, chemistry, physics and bacteriology. This measure, which has just been adopted by the superior council of public instruction, has been definitely decided on. This examination will make it possible for the university authorities to relieve the overcrowding of the faculties by eliminating in season the students incapable of pursuing their studies owing to their lack of training in the fundamental branches of medicine. Other proposed reforms are still pending and are giving rise to prolonged and serious discussions. One much discussed matter is the question of requiring students seeking enrolment in a faculty of medicine to hold a bachelor's diploma covering a knowledge of Latin and Greek. All the professors of the faculties of medicine favor this measure and affirm that a knowledge of Greek is indispensable for the understanding of modern medical terminology. But the professors of the facultés des sciences are opposed to this requirement, preferring that such knowledge be left optional, so as not to diminish the part played by the sciences in the preparation of future students of medicine, which is absurd, since the requirements for baccalaureate degrees in the sciences remain the same. Furthermore, it is desired that the diploma in physics, chemistry and the natural sciences, required at present for admission to the study of medicine, examinations for which are set by the facultés des sciences, be transferred to the faculties of medicine, where it would be deprived of its too theoretical character and would be given a direction truly medical. The facultés des

sciences are opposing such change, in order not to lose a part of their pupils. In addition, it is desired that the number of years of medical study, which is now five, be increased to six, the sixth year being spent by the student in a hospital, as an intern, in order that he may be more completely trained in the practice of medicine and general surgery, or may devote himself to some chosen specialty. It is objected that the cost of medical study, already very high, would be thereby increased for the parents or guardians of the students. But the medical syndicates see herein a means of diminishing the already excessive number of seekers of a medical career—and, on the other hand, scholarships could be granted, on the basis of competitive examinations, to students needing financial assistance.

The Lübeck Verdict

The Institut Pasteur, after the announcement of the verdict of the court in the lamentable Lübeck trial, in which the nature of the B C G vaccine was discussed during seventy-six sessions of excited debate, published a discreet note, addressed to the press, calling attention to the fact that the impartiality of the German court had clearly vindicated the harmlessness of the vaccine and recognized that the actions observed were ascribable solely to an error in handling that occurred in the laboratories of the Lübeck hospital, to which Professor Calmette had sent an absolutely harmless strain of the B C G vaccine. At the Academy of Medicine, when Professor Calmette entered, the president congratulated him, in the name of his colleagues, on the happy outcome of the trial, from which his reputation as a scientist had come forth unscathed. Professor Calmette thanked the president for his words of encouragement.

Traffic Accidents Involving the Circulation

According to the statistics communicated by the prefecture of police, 241 fatal accidents involving the circulatory system occurred in Paris, during the year 1931, and 258 in the suburbs, or a total of 499, as against 603 in 1930 and 639 in 1929. The decrease, which may be attributed to the strict application of measures prescribed by the prefect of police, is all the more significant in view of the fact that the number of automobiles is constantly increasing. The list of victims includes 60 per cent of pedestrians, 10 per cent of cyclists and 4 per cent of users of various vehicles. Fifty-four per cent of the accidents were due to errors of the drivers of the vehicles, and 41.5 per cent to errors of the victims. In the remaining cases, the responsibility could not be fixed. The fatal accidents were distributed as follows: taxis, 46; private automobiles, 179; trucks, 165; motorcycles, 32; bicycles, 5; streetcars, 34; autobusses, 24; horse-drawn vehicles, 14. The largest number of accidents occurred between 5 and 8 p. m., and the fewest between 2 and 6 a. m.

The Retirement of Professor D'Arsonval

Professor d'Arsonval, one of the leading authorities in physiology, has given up his chair in the Collège de France. Professor d'Arsonval is 81 years old but still possesses all his intellectual activity and never fails to attend the weekly meeting of the Academy of Sciences, of which he has been a member since 1894. But he has not attended the meetings of the Academy of Medicine for many years, although he has been a member since 1888. His scientific career was begun in the Collège de France in 1876, as assistant of Claude Bernard, of whom he became one of the principal collaborators. In 1882 he was appointed director of the laboratory of biologic physics in that institution and in 1894 became professor of experimental medicine. His name will remain associated with the study of high frequency currents and their medical use, termed today "d'arsonvalization." In connection with his retirement, the government bestowed on him the Great Cross of the Legion of Honor. The Collège de France has appointed as his successor Prof. Charles Nicolle, director of the Institut Pasteur de Tunis and a Nobel laureate, whose important researches on microbiology are universally known, notably on the rôle of lice in the transmission of exanthematous typhus, the immunizing effects of convalescents' serum in measles and scarlet fever, and the parasitic diseases of plants.

BERLIN

(From Our Regular Correspondent)

Feb. 29, 1932.

One Hundredth Anniversary of Goethe's Death

It has been the custom to regard Goethe as the prototype of *mens sana in corpore sano*, but even he had to bow to the fate of all mortals and to suffer from the visitations of disorders and disease. A survey of the pathologic history of the "greatest German" is presented by Dr. Hochstetter in the *Deutsche medizinische Wochenschrift*. Although little is known of the details, Goethe appears to have passed through the usual children's diseases: chickenpox, measles and "the countless torments of youth." His first serious illness, which developed in 1768, toward the end of his student days at the University of Leipzig, was associated with a violent hemoptysis, and it may be assumed that this illness, so much discussed by Goethe's biographers, was the result of a pulmonary hemorrhage of tuberculous origin. The painful swelling on the neck, which probably consisted of tuberculous glands and later had to be lanced, points in that direction. In Frankfort, Goethe became at this time "a weak and feeble creature, who appeared to be suffering mentally more than physically," treated by the physicians of the inner circle in which he moved. Treatment brought on a gradual improvement and recovery and from then on, up into the new century, Goethe enjoyed, in the main, good health. After a strenuous "campaign in France" in 1792, a rheumatic disorder, apparently lumbago, developed, for which he was treated with camphor. He had no serious illness further until 1801, when he had what appears to have been erysipelas of the head. In quest of health, Goethe went in the summer to Pyrmont, but the treatment there did not agree with him. He complained in these terms: "What an idea, after such a highly inflammatory disease, to send me to a resort with such stimulative baths. I became so irritable that a most violent circulation of the blood did not permit me to sleep at night, while, during the day, the most indifferent thing caused me to lose control of myself."

During 1805 and in the beginning of 1806, Goethe was sick a great deal with attacks of renal colic, which was possibly induced by kidney stones. According to the statements of the younger Voss, he had hematuria daily and suffered also from "stoppage of the urine." He took medicines patiently but loathingly. When Voss had to rub him down with alcohol, he refused at first but finally consented, saying "Well, if it must be, I will submit." At the end of May, Goethe went to Carlsbad, which he had visited in 1785, 1786 and 1795. His good health continued until he reached an advanced age. In February, 1823, however, in his seventy-fourth year, he was attacked by a new severe illness, which was caused by inflammation of the pericardium, with which was probably associated an inflammation of the costal pleura. There may have been moderate attacks of angina pectoris, as is especially indicated by the inconquerable pain in the heart region, of which Goethe complained. He was treated by the physicians Rehbein and Huschke, but often expressed doubts as to their skill. "Apply all your arts and artifices," he exclaimed, "that is all very fine; but I don't think you will be able to save me." He complained on one occasion that he was being given all the cursed stuff they could lay hands on, but on another occasion he said to Rehbein: "You are too timid with your remedies. You spare me too much. When you are dealing with a patient like myself, you must apply a little Napoleonic treatment." The patient's recovery was slow, and in November

or December of the same year he was again seized with what probably was pleurisy, although associated at the same time with heart symptoms. Not long after that, Dr. Rehbein, whom Goethe esteemed highly, died, so that he endeavored to find a worthy successor, who was to practice at court at the same time. His choice was Dr. Karl Vogel of Liegnitz, who not only treated him with great skill but also became a close friend. "That I am feeling so well is due to Vogel. If it had not been for him I would have left this mundane sphere long since," he said in 1830 to Eckermann. "Vogel is a natural born physician and, at the same time, one of the most genial and intelligent men that I have ever met. But it may be just as well if I do not say how good he is, lest he be taken away from me." How much Goethe, in spite of occasional doubts, thought of the skill of physicians may be seen from the words he uttered in 1827: "Our lives certainly cannot be lengthened a single day by the physician. We live as long as God has ordained, but there is a great difference whether we live miserably like so many poor dogs or well, in full vigor and health, and a wise physician can do a great deal toward bringing this about." From 1824 to the fall of 1830, Goethe was never seriously ill, but on Nov. 26, 1830, a violent hemoptysis occurred, which was doubtless due to excitement associated with the death of his son. After this natural, followed by an artificial, loss of blood, he recovered rapidly and was soon quite himself again. After a drive in windy weather, his last illness began, March 15, 1832, with "catarrhal fever." He had nearly recovered from this attack when, during the night from March 19 to March 20, a severe attack of angina pectoris occurred. Death ensued, March 22, at 11:30. "The dying man settled comfortably into the left side of the armchair and it was some time before the assembled friends could realize that Goethe had been taken from them." Dr. Vogel, who describes his death in detail, has also given interesting information in regard to his relations with his physicians: "Goethe considered disease as the greatest earthly evil. Pain was to him the hardest thing to endure of all bodily suffering. That he was in much better health during the last six years of his life than he had been just previously was due in great part to the fact that I succeeded in putting an end to his inordinate self-treatment. He was a grateful and obedient patient."

Infections of Old War Injuries

In a recent address before the Berliner Gesellschaft für Chirurgie, Prof. Max Busch, pathologist in the federal bureau of health, took occasion to speak of the strange fate of some ex-service men who, during the World War, were struck by a rifle bullet or a shell fragment and suffered severe bone injuries. They withstood the injury and were free from pain for many years, but after from thirteen to fifteen years death overtook them. That is an unusual observation from the scientific point of view and gives also important criteria for the question of operability and for the determination of possible compensation claims. A necropsy is, to be sure, a necessary presupposition, as it will often uncover peculiar and possibly absolutely unsuspected connections. One war-wounded man was struck in the thigh by a rifle bullet and suffered a severe comminuted fracture with a permanent fistula formation. Thirteen years later, micro-organisms were carried from this focus to the spinal cord; signs of paralysis appeared, and the patient died from cachexia. In the femur, numerous small projectile and bone fragments were found. In another instance the bullet struck the shoulder-blade and the clavicle. In this case an inflammation of the heart valves, which was due to fistulas in the region of the old shoulder wound, caused death after fifteen years. In a third case, ten years after a penetrating gunshot wound of the pelvis, suppuration developed in the kidney and in the thigh, the final outcome of which was fatal. In other cases, sepsis developed after many years, so that Busch leaves the question open as to whether an old infection flared up again or a new infection appeared. In any event, these rare happenings in connection with the deaths of ex-service men, after many years, give occasion to suspect an association with old wounds.

ITALY

(From Our Regular Correspondent)

Feb. 15, 1932.

Meeting of the Medicosurgical Society of Pavia

The Società medico chirurgica of Pavia met recently under the chairmanship of Professor Ferrata of the University of Pavia. Dr. Di Guglielmo spoke on general lipoidosis. He described a case of Gaucher's disease occurring in a girl aged 16 months, diagnosed on the basis of biopsy of the spleen and the bone marrow, and classified it as general lipoidosis, of which he distinguished three principal types: cerebrosidic lipoidosis, or Gaucher's disease; phosphatidic lipoidosis, or Niemann-Pick disease, and cholesterinic lipoidosis, or the Schüller-Christian syndrome. In his case, the speaker was able to demonstrate for the first time the presence of the Gaucher cell in the peripheral blood, which until then, although diligently searched for, had never been found by those who had studied the disease. While this should be accepted with due reservations, since only a single case is concerned, Dr. Di Guglielmo emphasizes the interest that attaches to this new blood observation, which, if it is confirmed, will make the diagnosis of Gaucher's disease simpler and easier.

Dr. Calleris read a paper on spirochaetosis icterohaemorrhagica and explained the diverse symptomatology in the clinical cases observed by him. He considered also the bacterial flora of the duodenal fluid. He made bacteriologic researches on the duodenal fluid of thirty-nine persons affected with various morbid types. A sample for examination was secured with the aid of the Einhorn sound. The speaker found that the organisms encountered with greatest frequency and in the greatest number are the streptococcus of the duodenum, Staphylococcus aureus and Bacterium coli. Of these organisms, while the first appears to be found indifferently in the various diseases, Staphylococcus aureus and Bacterium coli are encountered with some constancy in particular morbid types, such as angiocholitis and icterus infectiosus.

Uggeri spoke on nuclear inversion, or the Velez sign, in pulmonary tuberculosis. In his examinations of twenty cases of advanced pulmonary tuberculosis, he found the Velez sign to be frequent but not constant. In two of the three cases in which the sign was absent, the subsequent course was favorable.

The Conference on Rheumatism

Those who participated in the second conference on rheumatism, held at Salice (Milan), proposed that in the chief towns of the provinces a committee on rheumatism be appointed to organize the crusade against diseases of rheumatic origin, suggesting also short courses of study. They confirmed also the need of the creation of free dispensaries and ambulatoriums for persons of the less well-to-do classes, suffering from rheumatic manifestations. They recommended to the managements of the hospitals and other institutions that admit patients with acute articular rheumatism to follow up convalescents who have been dismissed or to direct them at the time of their dismissal to the local committee on rheumatism. They expressed also the desire that many Italian students should participate either in the form of original researches or by publishing statistical data pertaining to the diffusion of rheumatic disorders in Italy, in the international conference on rheumatism to be held in Rome in May.

Congress on Industrial Medicine

The tenth Congresso nazionale della società italiana di medicina del lavoro will be held at Milan, during the last days of April, 1932. The chief topics on the program are: (1) Intel-

lectual Work, presented by Professors Luigi Ferrannini of Catania and by Sante De Sanctis of Rome; (2) The Pathology of Solvents, and Hygienic and Prophylactic Measures, to be discussed by Professors Carozzi, Loriga and Nebuloni, and (3) Work in the Fields of Pathology, Hygiene and Social Legislation, with papers by Professors Castellino, Aiello, and other collaborators.

The New Municipal Hospital at Leghorn

At Leghorn there has been erected a municipal hospital that occupies an area of 110,000 square meters. It consists of fifteen large buildings, six of which belong to the hospital proper. Each pavilion has a capacity of 164 beds. The buildings are connected with one another by covered passages. The group of buildings includes a chapel, an administration building, scientific laboratories and a therapeutic pavilion. The total cost of the hospital was $1,300,000.

BELGIUM

(From Our Regular Correspondent)

March 3, 1932.

The Achievements of a Century

In commemoration of the one hundredth anniversary of the independence of Belgium, the *Scalpel*, one of the oldest medical journals in existence, having been established nearly eighty-five years ago, has published a special number, in which the most eminent medical authorities of Belgium sum up the accomplishments of the last century. The anatomic, physiologic, medical, surgical, obstetric, psychiatric, neurologic, ophthalmologic, otorhinolaryngologic, dermatologic and syphilologic sciences are passed in review. Likewise are presented the researches of the laboratories of pharmacodynamics of the Belgian universities and the results of the radiologic and curietherapeutic applications in Belgium from 1896 to 1930. Drs. Delattre, Langelez, Renaux and Timbal review the results obtained in the field of public hygiene from 1830 to 1930. The authors show that, while the development of our public hygiene, so closely associated with and dependent on the evolution of the medical sciences, may appear to have been slow up to the end of the nineteenth century and to be confined to the more or less efficient application of administrative or technologic measures, the era of Pasteur opened up paths in which it has given evidence of an activity that has brought forth most satisfactory results. The etiology of the various transmissible diseases once established, an adequate crusade was launched against each disease, and excellent results have usually crowned such efforts. Such pestilential diseases as cholera, the plague, exanthematic typhus, and smallpox, which in 1870 caused 4,163 deaths in a population of 5,000,000, have completely disappeared from the list of causes of death in Belgium. Malaria, which in the neighboring countries still necessitates a difficult and extremely expensive crusade, presents no cases in Belgium of indigenous origin. Typhoid, which formerly made serious inroads on our population, and from 1870 to 1880 was still the cause of more than 4,000 deaths annually, dropped to 224 cases in 1927. Diphtheria, the terror of mothers, which caused more than 4,000 deaths every year up to 1890, and still 1,828 deaths in 1900, was responsible for only 254 deaths in 1927. The deaths from scarlet fever dropped from 3,364 in 1870 (5,000,000 population) to 118 in 1927 (8,000,000 population); the deaths from measles from 3,320 to 679, and from whooping cough from 3,472 to 863. The mortality from pulmonary tuberculosis and tuberculosis of the bones or of the cerebral meninges, which was 35 per 10,000 of population, is today less than 9, its frequency having thus diminished by three fourths. Infant mortality, which in 1876 ranged around 167 per thousand living births, and in 1880 around 168, dropped to 107 in 1922 and to 92 in 1927, or, out of 145,275 living births, only 13,368 deaths of infants under 1 year of age. To sum up, it may be stated that, by reason of the development of the economic, social and, particularly, the hygienic conditions of the country, whereas in 1830, with a population of 4,000,000, 102,000 deaths were reported, almost exactly the same number of deaths are recorded now for a population that has doubled. Whereas, a hundred years ago, the expectancy of life for each child born was twenty-five years, today a probable average of fifty years of life is offered him in his cradle, owing to the progress of hygiene. It may be said that, whereas the mortality rate in 1830 was 25.57 per thousand of population, 23.26 in 1870, 20.85 in 1890 and 15.20 in 1910, it dropped to 13.84 in 1920 and to 13.46 in 1927.

The Medical Convention in Brussels

The medical convention in Brussels (Les journées médicales, so called) was held in memory of the French scientist Fernand Widal. Mr. Bezançon traced the main events in the life of Widal in an address that was loudly applauded. Many lectures were heard attentively by large audiences. Only a few of the topics can be discussed in detail.

CHLORIDES AND NEPHRITIS

Professor Merklen discussed mainly the question of chloremia. He referred to the large number of articles published in France and analyzed them rapidly. In the first group he considered nephritis associated with vomiting, decrease of chlorides in the blood and the tissues, azotemia, and normal or increased alkali reserve. This is the condition called by Blum azotemia due to lack of chlorides. This combination of symptoms is in reality not common; on the contrary, one observes usually in nephritis a type characterized by azotemia, plasmatic and corpuscular hypochloremia, with frequent vomiting, and a low alkali reserve. Rathery emphasized this as a terminal syndrome of chronic nephritis. The first type is curable by means of rechloridization, but the second type, contrary to what has been asserted, shows only slight effects from such treatment. The study of the observations shows that the diuresis, diminution of the urea in the blood, and increase of the urea content of the urine, appear in acute nephritis at about the same time whether rechloridization has been applied or not. The question is dominated by the state of the alkali reserve. It may be said that when the alkali reserve is low, not much can be expected from rechloridization, in spite of certain observations that appear to point to the opposite opinion. It appears that in the cure of nephritis of this type a more important part than is usually admitted is played by the mass of fluid administered along with the sodium chloride. The cases of acute nephritis that are cured are chiefly those in which the patients cannot retain the water in their tissues and in which the kidneys are permeable to water.

METABOLISM OF NITROGEN

Dr. Ambard communicated the results of his researches on the metabolism of nitrogen. He determined the percentage of urea in the urine hour by hour, which percentage corresponds in a general way to the percentage of urea in the blood, provided the subject has normal kidneys. He stated that if one studies the variations in the urea content during the morning, fasting, one will obtain a urea curve with a maximum on waking, which diminishes steadily until it reaches a permanent level. One finds that this level is reached at 11 o'clock. A feeling of hunger develops at just that time. If in the evening the subject is given a meal rich in nitrogen, the percentage of urea is considerable in the morning. An absolute fast causes a urinary disorder in the direction of a hyposecretion. The experiments must be carried out in a separate room, for if the subject is in a room with others and sees them eat, a psychic secretion develops and, at the same time, there is an increase of the secretion of urea. In the dog in which an esophageal fistula is made, a hypersecretion of urea is brought about when he swallows his food. The metabolism of urea constitutes an important function, for 60 per cent of the tissues of the body produce urea. It has been established by the experiments of

Ambard that there is an objective sign of hunger characterized by a variation in the percentage of urea in the urine.

CHRONIC RHEUMATISM

Dr. Bersaques discussed the pathogenesis and the therapy of chronic rheumatism. He emphasized the need of prudence in diagnosing a case as rheumatism. He excludes from the bracket of rheumatic disorders neuritis and syphilitic, tuberculous and gonococcal arthritis, and emphasizes the importance of a complete examination of the patient, of a systematic research for Wassermann reactions in the blood and in the cerebrospinal fluid, and of the search for the gonococcus. He cited examples of failures due to the neglect of such researches.

Leaving out of consideration acute rheumatism as frankly infectious, and rheumatism due to a focal infection, which is decreasing every day in importance, there remain, with reference to chronic rheumatism, three points that appear to be settled: (1) It is an endogenous or exogenous intoxication; (2) there is a rheumatismal constitution or diathesis, and (3) diet has a considerable influence on rheumatism. To determine the bases of the diathesis, the author studied the blood of rheumatic patients. The data on calcium explained nothing. The metabolism of uric acid is not at all conclusive; nevertheless, it is increased in 56 per cent of the cases. But, on the other hand, 26 per cent of patients with gout have a diminished uricemia. These facts do not agree. The blood sugar is not changed much. The author raises the question whether a liver disorder is not at the base of the diathesis. The same disturbances are found also in obesity and in thyroid disorders. Are they possibly secondary to an endocrine disorder? Be that as it may, the liver is involved. The influence of diet and the test of provoked hyperglycemia furnish evidence of this. Patients who suffer habitually from migraine and constipation are often rheumatic patients. In treating rheumatic patients, the first attack should be directed against the disordered hepatic function.

LESIONS OF THE SPINAL COLUMN

Dr. Lippens demonstrated the possibility of proving the existence of slight lesions or of minimal malformations that make it necessary to give credit to the complaints of patients, otherwise sometimes dismissed as neuropaths, but more often treated rudely as malingerers. There are two modes of exploration absolutely indispensable and intimately associated: the clinical and the radiographic, which make possible a diagnosis provided they are exceedingly circumstantial and are carried out under certain conditions. Three classes of lesions may be thus brought to light: congenital, traumatic and constitutional. The congenital and the constitutional lesions are evidently not caused by an accident, but an accident may unleash a train of symptoms or accentuate existing symptoms. These lesions often throw light on manifestations in themselves inexplicable, disorders positively rebellious, and an incapacity for work. It goes without saying that it is important to show in these cases a careful discrimination, the elements of which were brought out by the speaker. As for traumatic lesions, Dr. Lippens pointed out the difficulty that sometimes arises in discovering them and the disadvantages of denying their existence without sufficient control. These two errors lead to vertebral displacement, the consequences of which, from the economic point of view, are incalculable; for, while it may be possible by a tardy intervention to check the evolution, it is impossible to remedy the anatomic damage. The author spoke also on the Kümmel-Verneuil disease, which is at present so prevalent, and of the nucleus pulposus. He gave some striking examples of central intraspongiose hernia and of intracanalicular lateral hernia. He then discussed briefly the treatment and the need of not following under all circumstances to the utmost degree the principle of mobilization justly in favor in fractures of the extremities. In Dr. Lippens' opinion, Albee's graft constitutes, in the majority of cases, the best curative or palliative treatment.

Marriages

CLARENCE D. MOFFATT, Vancouver, B. C., to Miss Dorothy Young of High River, Alta., February 13.

DAVID MAETH, New York, to Miss Florence E. Chivers of London, England, in Los Angeles, April 4.

EHRLING L. BERGQUIST, Flushing, N. Y., to Miss Gertrude Babcock of Fairfield, Conn., March 5.

HAROLD C. WEISENBARGER to Miss Carrie Evelyn Hetrick, both of New York, April 6.

Deaths

Charles Hampson Jones ✠ Baltimore; University of Edinburgh Faculty of Medicine, Edinburgh, Scotland, 1883; secretary of the Section on Preventive Medicine and Public Health, American Medical Association, 1910-1914, and chairman, 1914-1915; professor of hygiene and public health, University of Maryland School of Medicine and College of Physicians and Surgeons; lecturer in public health, Johns Hopkins University School of Hygiene and Public Health; professor of physiology, Women's Medical College, 1884-1887; instructor in histology, College of Physicians and Surgeons, Baltimore, 1889-1895, and professor of obstetrics, 1895-1898; member of the state board of health, commissioner of health of Baltimore and registrar of vital statistics; chief of the bureau of communicable diseases, state board of health, 1915-1919; member of the American Public Health Association, member of the governing council, 1923-1924; aged 73; died, April 11, in the University Hospital, of heart disease.

John Nicholas Coghlan ✠ Portland, Ore.; University of Vermont College of Medicine, Burlington, 1892; formerly clinical professor of otolaryngology, University of Oregon Medical School; member of the Pacific Coast Oto-Ophthalmological Society and fellow of the American College of Surgeons; surgeon to the Portland Eye, Ear, Nose and Throat Hospital; aged 66; died, March 8, in St. Vincent's Hospital, of pneumonia.

Malachi Richardson Combs, Terre Haute, Ind.; Medical College of Indiana, Indianapolis, 1885; member of the Indiana State Medical Association; fellow of the American College of Surgeons; past president of the Vigo County Medical Society; first president of the Terre Haute Academy of Medicine; formerly secretary of the board of health; chief of staff of the Union Hospital; aged 68; died, April 11, of leukemia.

Arthur Lemuel Stocks, Muskogee, Okla.; Chicago Homeopathic Medical College, 1896; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the Oklahoma State Medical Association and the Radiological Society of North America; past president and secretary of the Muskogee County Medical Society; aged 59; died, March 26, of angina pectoris.

William Phelan Driscoll ✠ New York; Yale University School of Medicine, New Haven, 1919; fellow of the American College of Surgeons; instructor in obstetrics and gynecology, Cornell University Medical College; on the staffs of the Misericordia Hospital, Woman's Hospital, Bellevue Hospital and the Booth Memorial Hospital; aged 36; died, March 29, of pneumonia.

Gustav J. Kaumheimer, Milwaukee; College of Physicians and Surgeons of Chicago, 1887; member of the State Medical Society of Wisconsin; past president of the Milwaukee County Medical Society; on the staffs of the Milwaukee Hospital, Evangelical Deaconess Hospital and the Johnston Emergency Hospital; aged 69; died, March 12, of angina pectoris.

Edward Finley Waddle, Chillicothe, Ohio; College of Physicians and Surgeons, Baltimore, 1883; member of the Ohio State Medical Association; veteran of the Spanish-American War; aged 71; died, March 9, in the U. S. Veterans' Hospital No. 97, of cirrhosis of the liver with general ascites, nephritis and myocarditis.

Benjamin Rush McAllaster, Mount Pleasant, Iowa; State University of Iowa College of Medicine, Iowa City, 1894; member of the American Psychiatric Association; served during the World War; assistant superintendent of the Mount Pleasant State Hospital; aged 64; died, March 10, of heart disease.

David William Stevenson ✠ Akron, Ohio; Rush Medical College, Chicago, 1890; member of the American Academy of Ophthalmology and Oto-laryngology and fellow of the American College of Surgeons; on the staffs of the Akron City and People's hospitals; aged 66; died, March 29, of heart disease.

Francis Melancthon Arthur, Hamilton Square, N. J.; Baltimore Medical College, 1901; member of the Medical Society of New Jersey; bank president; for many years on the staff of the Mercer Hospital, Trenton; aged 56; died, March 5, of embolism of the coronary artery.

Frederic Beach Jennings, Jr., Baltimore; Columbia University College of Physicians and Surgeons, New York, 1921; voluntary assistant in pathology, Johns Hopkins University School of Medicine; aged 41; died, March 29, of poison, self-administered.

Charles David Treister, Cleveland; Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1912; served during the World War; aged 41; died, March 26, in St. Luke's Hospital, of nephritis and myocarditis.

John Deyo, Newburgh, N. Y.; Bellevue Hospital Medical College, New York, 1877; formerly health officer and member of the board of health; on the staff of St. Luke's Hospital; aged 77; died, March 6, of cerebral hemorrhage and arteriosclerosis.

Willis P. Dooley, Akron, Colo.; University of Indianapolis Medical Department, 1897; member of the Colorado State Medical Society; aged 63; died, March 8, in a hospital at Galveston, Texas, of injuries received in an automobile accident.

Walter Johnson Aldrich, Independence, Kan.; Bellevue Hospital Medical College, New York, 1893; member of the Kansas Medical Society; county coroner; aged 65; died, March 8, in the Mercy Hospital, of pneumonia and influenza.

Charles Benjamin Langsam, Cleveland; Hahnemann Medical College and Hospital of Philadelphia, 1925; member of the Ohio State Medical Association; aged 33; died, March 22, in the Mount Sinai Hospital, of pneumonia.

Manuel Victorino Sylvia ✠ New Bedford, Mass.; University of the City of New York Medical Department, 1891; on the staff of St. Luke's Hospital; aged 63; died, March 22, of angina pectoris and chronic myocarditis.

Charles N. Williamson, Gentry, Mo.; University Medical College of Kansas City, 1899; member of the Missouri State Medical Association; formerly postmaster; aged 59; died, March 15, of cerebral hemorrhage.

Louis Stricker, Cincinnati; Medical College of Ohio; Cincinnati, 1891; member of the Ohio State Medical Association; for many years on the staff of the Jewish Hospital; aged 68; died, March 14, of heart disease.

Peter McLean, Laurinburg, N. C.; University of Maryland School of Medicine, Baltimore, 1906; member of the Medical Society of the State of North Carolina; aged 51; died, March 22, of pneumonia.

Henry Ashburn Davis, Cairo, Ill.; Bellevue Hospital Medical College, New York, 1896; member of the Illinois State Medical Society; aged 60; died suddenly in March, at Cayce, Ky., of heart disease.

Daniel Welles Lippincott, St. Louis; Washington University School of Medicine, St. Louis, 1931; intern, St. Louis City Hospital; aged 26; was found dead, March 26, with a bullet wound in his heart.

Chester Arthur Bardsley, Laurel Springs, N. J.; Medico-Chirurgical College of Philadelphia, 1913; member of the Medical Society of New Jersey; aged 44; died, March 18, of acute myocarditis.

Zachary Newton Thornton, Forreston, Texas; University of Texas School of Medicine, Galveston, 1900; member of the State Medical Association of Texas; aged 61; died, in March, of heart disease.

Gustin Welch ✠ Niagara Falls, N. Y.; Trinity Medical College, Toronto, Ont., Canada, 1896; aged 65; died, March 20, in the Memorial Hospital, of lobar pneumonia and Parkinson's disease.

William W. Deatherage, Auburn, Ill.; Barnes Medical College, St. Louis, 1894; aged 68; died, March 14, in St. John's Hospital, Springfield, as the result of injuries received in a fall.

Samuel H. Kellam, Cherryvale, Kan.; College of Physicians and Surgeons, Medical Department Kansas City University, 1900; aged 63; was found dead, in March, with a gunshot wound.

Granville A. Hulett, Springfield, Ill.; Chicago Medical College, 1884; member of the Illinois State Medical Society; formerly a druggist; aged 72; died, March 4, of heart disease.

James A. Miller ✠ Farmington, Mich.; Detroit College of Medicine, 1900; formerly village president; health officer of Farmington; aged 57; died, March 1, of cerebral hemorrhage.

George Grant Howery ✠ Christiansburg, Va.; Lincoln Memorial University Medical Department, Knoxville, Tenn., 1912; aged 45; died, March 8, in a local hospital, of pneumonia.

Kell M. Ellsworth, Dayton, Ohio; Eclectic Medical Institute, Cincinnati, 1899; member of the Ohio State Medical Association; aged 70; died, March 6, of cerebral hemorrhage.

Walter Spencer Clack, Chattanooga, Tenn.; Vanderbilt University School of Medicine, Nashville, 1903; served during the World War; aged 54; died, March 14, of angina pectoris.

Thomas Armstrong Speidel, Felicity, Ohio; Medical College of Ohio, Cincinnati, 1904; member of the Ohio State Medical Association; aged 49; died, March 10, of pneumonia.

Orlo Elbert Coakley, Creston, Iowa; Barnes Medical College, St. Louis, 1901; member of the Iowa State Medical Society; aged 50; died, March 3, of carcinoma of the larynx.

William Bernard Kenney, Pawtucket, R. I.; College of Physicians and Surgeons, Baltimore, 1902; aged 54; died, March 11, of arteriosclerosis, chronic nephritis and uremia.

Henry Albert Laye, Galeton, Pa.; Louisville (Ky.) Medical College, 1907; aged 52; died, March 11, in the U. S. Veterans' Hospital, Oteen, of chronic pulmonary tuberculosis.

Earl Gilbert Coverdale, Decatur, Ind.; Rush Medical College, Chicago, 1902; member of the Indiana State Medical Association; aged 52; died, March 2, of heart disease.

George W. Walker, Chetopa, Kan.; University of Louisville (Ky.) School of Medicine, 1897; aged 76; was killed, March 11, when he was struck by an automobile.

Laurence Corley, Midway, Texas; University of Tennessee Medical Department, Nashville, 1893; aged 60; died, in March, at a hospital in Crockett, of myocarditis.

John Beatty Renfrew, Los Angeles; College of Physicians and Surgeons, Los Angeles, 1918; aged 38; died, March 15, in the French Hospital, of pneumonia.

William A. Funk, Parkersburg, W. Va.; Baltimore University School of Medicine, 1900; aged 57; died, March 12, following an operation for appendicitis.

Fred Rice Belknap, Benton Harbor, Mich.; Bellevue Hospital Medical College, New York, 1888; aged 69; died, March 5, of chronic arthritis and myocarditis.

Nevin B. Shade, Washington, D. C.; Jefferson Medical College of Philadelphia, 1878; aged 83; died, February 29, in Miami, Fla., of bronchopneumonia.

Jeremiah Reade, New Augusta, Ind.; College of Physicians and Surgeons of Indiana, Indianapolis, 1876; aged 81; died, March 16, of arteriosclerosis.

James Matthew Monaghan, Margate City, N. J.; Medico-Chirurgical College of Philadelphia, 1896; aged 58; died, March 14, of heart disease.

Frank James Connelly, Newark, N. J.; Bellevue Hospital Medical College, New York, 1892; aged 62; died, March 5, of carcinoma of the tongue.

James Lytle Moore, Toledo, Ohio; Toledo Medical College, 1907; aged 47; was found dead, March 5, of chronic parenchymatous nephritis.

Samuel F. Thurman, Potosi, Mo.; Kentucky School of Medicine, Louisville, 1889; aged 71; died, February 29, of sarcoma of the right lung.

Frederick M. Nufer, St. Louis; American Medical College, St. Louis, 1901; aged 60; died, March 8, of chronic myocarditis and nephritis.

James Floyd Abel, Dayton, Tenn.; Vanderbilt University School of Medicine, Nashville, 1883; aged 74; died, January 7, of bronchopneumonia.

Silas W. Polk, Milan, Tenn.; Meharry Medical College, Nashville, 1906; aged 53; died, March 12, in Nashville, of cerebral hemorrhage.

Robert Tilden Boals ✠ Salem, Ore.; University of Oregon Medical School, Portland, 1905; aged 54; died, March 10, of cerebral hemorrhage.

William Philp, Hamilton, Ont., Canada; Victoria University Medical Department, Coburg, 1863; aged 94; died, February 9.

Thomas George Sheats, Carrollton, Ga.; Atlanta Medical College, 1881; aged 73; died, February 13, of pneumonia.

Bureau of Investigation

DUR-INDA, OR LUKUTATE REDIVIVUS

Physicians and Others Are Solicited to Buy Stock in a Nostrum Concern

The Durian Corporation of America declares itself a Delaware corporation, doing business in New York City and Rochester, N. Y. The Bureau of Investigation has received a number of inquiries from Rochester, N. Y., from physicians, from the Better Business Bureau of that city, and from the Chamber of Commerce of that city. I. W. Steele & Company, whose business, according to their letterhead, is "Investment Securities," are sending out prospectuses and form-letters offering ten thousand "Founders' Shares" in the Durian company at $10 a share.

"Dur-Inda" is a later name for what has been known as "Lukutate," which was put on the American market a few years ago by the Lukutate Corporation of America. Lukutate was the subject of an article in this department of THE JOURNAL, January 25, 1930. There it was pointed out that when a "patent medicine" begins to lose its pulling power in the country in which it is first put out, it seeks new fields and fresh victims. Lukutate started in Germany and, in due time, its value having been correctly appraised, it was relegated to the limbo of forgotten nostrums. Then came the Lukutate Corporation of America, which was created, apparently, to convince the people of the United States that in Lukutate we had a new "sexual rejuvenator."

Lukutate was introduced into this country with the usual amount of hokum that accompanies European nostrums. An imposing array of German and Austrian testimonials was part of the "come-on," some of these purporting to have been written by medical men. Lukutate was sold at first in America in several forms—a "tincture" (containing 49 per cent of alcohol), a "fruit preparation," a marmalade, etc. Later—in 1931—Lukutate was put out in tablet form—the form in which the present Lukutate, under the name Dur-Inda, is now being marketed.

An aphrodisiac slant pervaded the older Lukutate advertising. Thus:

> "The number of people rejuvenated through transplanting of monkey glands is limited. The *question* therefore arises: *Are we to give up all hope?* The *answer* is *'Certainly not.'*
> "All previous experiments in the direction of rejuvenation have been eclipsed by the great discovery of a preparation called Lukutate, containing fruits coming from India. Encouraged by the amazing rejuvenating effects witnessed in animals, the logical act was to try the effect of these Indian Fruits contained in Lukutate on human beings."

According to the 1931 Lukutate advertising: "Remember, Lukutate is a food, a fruit food—not a drug." The same advertising dwelt subtly and vaguely with the ever-popular idea of sexual rejuvenation. Thus, in describing the alleged origin of Lukutate, the reader was told that a traveler in the Malay Archipelago came across some native tribes who lived "far beyond the years of the white man," who had "no nervous disorder, no impotency or sexual breakdown," etc., etc. The explanation? Durian, the ingredient of Lukutate. According to the same advertising:

> "For some reason, known only to herself, nature has concentrated a tremendous source of energy in the Durian—A VERITABLE STORAGE BATTERY OF DYNAMIC POWER that needs but to be absorbed by the human system to transform itself into amazing vitality."

Nature is, indeed, wonderful!

Some of the physicians in Rochester, N. Y., where the Durian Corporation stock-selling scheme is being pushed, have written to the Bureau of Investigation asking whether Dur-Inda is a "food" or a "drug." In answering this question, the Bureau has pointed out that both foods and drugs that enter into interstate commerce come under the purview of the national Food and Drugs Act, and a drug, by the definition of the Act, is, in effect, a product that is sold for the cure, mitigation or prevention of disease in man or animals.

In one of Steele & Company's stock-selling circulars, those who are urged to purchase what are described as "Founders' Shares" in the Durian Corporation of America, are asked to consider for a moment the tremendous commercial success in the sale of Lydia Pinkham, Vaporub, Kruschen Salts, and various other "patent medicines." Quite obviously, Steele & Company consider—and rightly so—that the product put out by the concern whose shares they are trying to sell belongs to the same class of preparations, *viz.*, "patent medicines."

According to Steele's prospectus, Dur-Inda is "a compact, concentrated tablet containing 100% Oriental fruits." This, of course, allows the exploiters to claim that their product is a "food" and not a "drug"—a claim that they may find useful in trying to get people to put money into the exploitation of their nostrum. The trick is an old one in the "patent medicine" field. Because of the natural aversion of the more intelligent part of the public to the "patent medicine" business, certain shrewd exploiters of products of this type, when their preparations do not happen to contain dangerous substances, attempt to make the public believe that what they are selling is not a "drug" but a "food." If nothing more potent than colored water is bottled, given a fancy name, and sold direct to the public for the self-treatment of human ailments, it is a drug under the meaning of the national Food and Drugs Act and a "patent medicine" in the colloquial meaning of that term. This holds true for Dur-Inda.

According to the same promotion prospectus of Steele & Company, while the sale of Dur-Inda is at present a mail-order proposition, prospective purchasers of stock are led to believe that it will be but a short time before "sixty thousand drug stores throughout the country" are handling it! Glib but vague references to "vitamins" and "minerals" are made in the prospectus, thus:

> "It is hardly necessary to emphasize the vital part which vitamins play in our daily lives, and their responsibility for our physical well being. Scientific tests to determine the various vitamin effects of Dur-Inda have been conducted by two leading authorities of this country.
> "The extraordinary mineral content of Dur-Inda was determined by Dr. H. D. Pease of the world renowned Pease Laboratories of New York.
> "Still further progress is being made, and surprising results already have come to the surface indicating that more startling (perhaps sensational) discoveries will soon follow."

Just what advertising claims are going to be made for Dur-Inda is not altogether clear from the stock-selling prospectus of Steele & Company. Possibly a quotation credited to Lord Lytton, which is featured on the front page of the prospectus, may contain the key note to the advertising campaign that will follow. It reads:

> "WHY should there not be in Nature one primary essence, one master substance, in which is stored the specific nutriment of life?"

It may also be partly outlined in the statement of another circular issued by Steele & Company, which, after stating that Dur-Inda is the trade name for a combination of certain fruits which grow wild in the Malay Archipelago, declares:

> "The importance of these fruits to physical life is evidenced in the lives of the natives who eat them. Immune from the scourge diseases of the white man, these simple and primitive people live practically disease-free lives way beyond the century mark and yet retain the functions and appearance of much younger people. During the few years that these fruits have been available in America, the record has abundantly confirmed the storied wonders of them in their native habitat.

Strange that scientific medicine knows nothing about these alleged wonders!

Summed up, it may be said that, even accepting at its face value the statement of the Durian Corporation of America, that their tablets are one hundred per cent fruit, Dur-Inda is evidently just another "patent medicine." The article on Lukutate that appeared in THE JOURNAL over two years ago, closed with this statement: "How long will Lukutate last in the United States? That will depend on the amount of money that the Lukutate Corporation of America is willing to spend in advertising." We believe exactly the same comment can be made on Dur-Inda.

An Adjunct to Neurologic Diagnosis.—Encephalography has become an indispensable adjunct to neurologic diagnosis. Following Dandy's introduction of this procedure in 1919, many workers have utilized it, and numerous extremely important cases have been reported in which the diagnosis was clarified by its use.—Davidoff, L. M., and Dyke, C. G.: An Improved Method of Encephalography, *Bull. Neurol. Inst. New York* **11**:75 (March) 1932.

Correspondence

PRESCRIBING OF ALCOHOLIC LIQUORS BY PHYSICIANS—A STATEMENT BY DR. ARTHUR DEAN BEVAN

To the Editor:—On February 5 I testified before a Senate committee in Washington, which was holding a hearing on the Bingham bill, which sought to amend the prohibition law so as to permit the manufacture and sale of beer containing 4 per cent of alcohol. My testimony was given wide publicity in the daily press and I find that some of it was misrepresented and misunderstood. I would therefore like the opportunity to correct any erroneous impressions which may have been formed. I stated that the doctor is authorized to write 400 prescriptions a year for a pint of whisky and that a number of doctors had not been able to resist the temptation of selling these prescriptions to patients—some of them selling their full quota of 400 prescriptions a year and a number had even sold their entire books to bootlegging druggists and bootleggers.

I feel that the writing of millions of prescriptions for a pint of whisky a year, the bulk of which may be used for beverage purposes and not for medicine, is a disgrace to the medical profession. I believe that the great bulk of the illegal and unethical prescriptions are written by a small minority of the members of the medical profession and I believe that the great majority of the profession are entirely ethical and sound on this problem. There is no finer body of men in any profession or any field of work than the men in the medical profession. They need no defense from me or from any one else. I feel that the abuses which have developed in the writing of unethical and illegal prescriptions for whisky should be frankly and fully exposed and eliminated.

This alcohol question is one of the most important problems that confront the people and the medical profession of this country. It is largely a medical problem, a problem in preventive medicine and public health. I feel that the organized medical profession of this country, the American Medical Association, should assume the leadership in this matter and should attempt to eliminate, as far as it is possible to do so, the injury done by alcoholic drink. I believe that the medical profession should handle this problem in exactly the same way that we are attempting to handle such great medical problems as tuberculosis and venereal disease.

ARTHUR DEAN BEVAN, M.D., Chicago.

MALARIA IN NARCOTIC ADDICTS

To the Editor:—The unusual presence of six cases of malaria at one time in the San Francisco Hospital led to an investigation to determine the source of infection. The accuracy of the department's investigation is plainly manifest. Nothing like this in my experience has ever occurred before. Five of the patients were morphine addicts using the hypodermic method:

1. W., aged 32, quartan type, onset February 1, a guest of the Hunter House, 675 Howard Street; also the Arcade House, 66 Clay Street, at the time of onset.
2. O., aged 45, tertian type, onset February 6, a guest of the New York House, 753 Howard Street.
3. W., aged 41, tertian type, onset February 1, dwelling place unknown.
4. J., aged 42, tertian type, onset February 28, dwelling place unknown.
5. B., aged 39, tertian type, onset February 13, a guest of the Golden Eagle Hotel, 253 Third Street.

They were all treated at the San Francisco Hospital, where the diagnoses were confirmed by the demonstration of living organisms in the blood. All recovered and were discharged, except patient 4, who died of pneumonia, and who was also a mental case.

In my opinion either patient 1 or patient 3, whose dates of onset were the same, infected the others by the common use of the syringe, although they denied this; but I have had this statement checked by the clerk of the Hunter House, who says it is a custom to pass the syringe around when they are congregated in a room free from intrusion. It is obvious that, owing to the character of these men, their statements cannot be believed.

Inspection was made at three of these hotels for evidences of mosquitoes and breeding places without results. The men were all cautioned about the danger of spreading disease in this manner and advised to disinfect the syringe subsequent to each injection.

J. C. GEIGER, M.D., San Francisco.
Director of Public Health.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CALCIUM AND VIOSTEROL IN PREGNANCY

To the Editor:—My wife is pregnant. I propose to administer sufficient calcium, iodine and vitamin D to prevent dental caries and goiter and favor normal dentition in the fetus. Will you therefore answer the following: 1. How much calcium is there in 1 quart of whole cow's milk? 2. What is the calcium lactate equivalent? 3. If it becomes necessary to diminish or eliminate milk from the diet to keep down the mother's weight and prevent excessive growth of the fetus, what is the minimum amount of milk or calcium lactate that should be administered daily? 4. Is there any advantage in calcium gluconate or other preparation of calcium over calcium lactate? If so, please state equivalent amounts. 5. How much iodine in the form of Stearodine tablets should be administered? 6. What amounts of the following would you recommend: (*a*) Mead's plain cod liver oil? (*b*) Mead's cod liver oil with viosterol 10 D? (*c*) White's cod liver oil concentrate tablets? (*d*) Viosterol 250 D?

M.D., Ohio.

ANSWER.—1. One and two-tenths grams.

2. The lactate ion removes approximately one half of the calcium; hence the amount of calcium lactate necessary to replace the calcium in one liter of milk is about 2.5 Gm.

3. Since there is not much nourishment in a glass of cow's milk (about 120 to 140 calories), a pregnant woman may take two glasses of milk daily without fear of an increase in weight due to the milk. For most adults the intake of 1 Gm. of calcium or about 2 Gm. of calcium lactate each day is sufficient. Nearly all this calcium may readily be obtained in vegetables and fruits. It has not been proved that an unusual increase in the mother's weight necessarily implies excessive size of the fetus, for there is no constant ratio between the gain in weight of pregnant women and the weight of new-born babies.

4. Calcium gluconate is the most pleasant to take by mouth but it is harder to absorb. The most absorbable form of calcium is calcium chloride, but it is the most disagreeable to the taste. The absorbability of calcium lactate is between the chloride and the gluconate. The latter is more expensive and if used should be taken in the form of the commercially sold 1½ grain tablets three times a day throughout pregnancy.

5. Stearodine tablets contain from 26 to 28 per cent of iodine. Each tablet is the equivalent of 0.01 Gm., or one-sixth grain, of iodine and for prophylaxis one tablet a week is sufficient.

6. (*a*) One tablespoonful daily.
(*b*) One tablespoonful daily.
(*c*) From five to ten tablets daily.
(*d*) Thirty drops daily.

HAZARDS FROM BENZENE TO ROOFERS

To the Editor:—I have a patient with aplastic anemia who has been working considerably with petroleum pitch and with asphalt roofing. Can you tell me whether either of these products contains benzene and, if so, is it in sufficient quantity to be a causative factor in anemia? I will appreciate any information you can give me pertaining to this matter.

C. J. MEREDITH, M.D., Valley City, N. D.

ANSWER.—Some petroleum pitches, and other roofing materials, require "cutting back." That is, they are softened up by divers hydrocarbons in which benzene and benzine may be included. In the application of sheet roofing, it is common to make use of a binder, which may be a thin asphalt or other

tarry substance. In these binders, benzene and other hydrocarbons may occur. While it may not be said that a hazard of benzene or of benzine regularly exists either in the manufacture or application of composition roofing materials, the occurrence of scattered cases may be accepted as reasonable. *Industry Reports* (Retail Credit Company, Atlanta, Ga. **5**, number 3, March, 1930) under the heading "Composition Roofing" discusses the several hazards attending exposure to roofing materials. Among other statements made is the following: "Frequently, batches of roofing material are too hard to permit manipulation. This hardness may lead to what is known as 'cutting back.' The cutting solvent may be a tar that is too thin for practical use, carbon bisulphide, light oils, benzene, benzine, etc."

BURNS FROM HYDROLENE

To the Editor:—Would you kindly give me some information on the treatment of burns from hydrolene? This is a preparation that is used for insulation in the manufacturing of electric refrigerators. It is necessary to bring it to a very high temperature before it will melt. I have had a number of severe burns and find that they are extremely slow in healing in addition to causing a marked chemical cellulitis. When the hot hydrolene splashes on the hands or forearms, it resembles hot tar. The temperature of the splashed portion remains at a high degree for several minutes. It cannot be brushed or wiped off easily by the employee. Can you suggest a good solvent, and would it be possible to add an acid or alkali along with this solvent? Please omit name.

M.D., Michigan.

ANSWER.—Hydrolene is one of several trade names for blown asphalts. Aeration at high temperatures imparts to asphalt certain qualities resembling those of rubber. The melting point may become as high as 220 C.

The damage done by hydrolene is primarily the result of heat; but, secondarily, retained hydrolene may from chemical action further injure the tissues. A carcinogenic agent may be present.

Blown asphalts are not soluble in alkalis or acids. All the quick acting solvents are themselves skin irritants or are absorbable through the skin. Best in the lot are acetone and benzine (gasoline). Mineral oils slowly soften up asphalts and are nontoxic.

In using naphtha, benzine and similar hydrocarbons, actual submersion is undesirable. Sponging with rubbing alcohol is preferable. Effort should be made to remove all traces of the asphalt from the flesh. After this process of chemical cleansing, alkalis may be used as suggested in the query, in the manner attending the alkali treatment of any burn.

WORD BLINDNESS

To the Editor:—What causes word blindness? I know where the lesion is located when the condition exists, but what I want to know is How can a physician determine whether the disease causing destruction of the angular gyrus, which is the seat of the word memory, is due to a tumor or a thrombus of a branch of the meningeal artery when there is no heart lesion? I recently saw a man, aged about 45, who is said to have word blindness, and the patient says that it happened while he was plowing in the field. Will he ever recover? How can he be treated or handled? Is word blindness ever a permanent disease? It seems to me that if it is due to a small tumor it might be permanent. Will the opposite side of the brain take care of the diseased side? I mean that if the lesion is in the left side and that part of the brain is destroyed will the right side of the brain so develop as to allow a patient to again recognize word letters and figures? Can a lesion be so destructive to the angular gyrus of the left side in a right handed person as to render it unable to function again? Can a lesion be so small as to affect the angular gyrus and cause word blindness and not do damage to the auditory word area and cause word deafness? Please omit name.

M.D., Mississippi.

ANSWER.—The problem indicated here is the same that is often faced in the case of hemiplegia and ordinary aphasia. These syndromes may be exactly the same whether due to vascular lesion, tumor or abscess. The diagnosis may be impossible, but as a rule the history, associated symptoms, physical signs and results of laboratory tests make a diagnosis possible. Thrombosis may occur without the heart lesion, and the onset of aphasic or paralytic symptoms in brain tumor may be sudden. If there is much headache, and particularly if the optic nerves are hyperemic or edematous, tumor must be strongly suspected. If so, exploration is justifiable but may be preceded by ventriculography. A simple and convincing sign of tumor in this region may be elicited if the ordinary lateral rontgenogram of the head has shown a distinct pineal shadow. If a postero-anterior view is taken in a certain way, the pineal shadow will be found moved over to the side opposite the tumor. This so-called pineal shift is less likely to take place with a vascular lesion.

VISUALIZING CALCULI

To the Editor:—Approximately, what percentage of kidney and gallbladder calculi are demonstrated radiographically? Is the use of an opaque dye for gallbladder visualization an assistance in demonstrating calculi or is it intended mainly for gallbladder function?

HELENA L. READ, New York.

ANSWER.—Practically 99 per cent of renal calculi are demonstrable roentgenologically, about 1 per cent of pure uric acid stones or cystin culculi escaping detection on the simple film. Numerous sources of error must be ruled out, such as gallstones, calcified mesenteric glands, foreign bodies, calcification in costal cartilages, pancreatic stones, skin folds, and tumors, fractured transverse processes and phleboliths.

Of gallstones, from 35 to 40 per cent may be shown on the simple film by proper technic, this being the proportion of biliary calculi containing enough lime to cast a detectable shadow. By means of cholecystography another large percentage of stones (nonopaque) may be shown as filling defects in the gallbladder shadow. Still other cases of nonopaque gallstones are accompanied by "absence of shadow" (failure of the gallbladder to visualize) by the Graham test. Aside from the stones opaque because of lime content, for which cholecystography is not needed except for identification purposes, upward of 90 per cent of gallstones should give on a Graham test either "stone positive" or "absence of shadow." The latter group of cases show gallstones at operation in 75 per cent. It is true that the Graham test is a good index of function also. The normal Graham test (normal uniform density, normal contours and normal filling and emptying) is an excellent guide to pathologic change in the gallbladder, stones rarely being found in such cases at operation and then only small ones. Of course, excellent roentgenographic technic is required for such results.

PROSTATITIS AND MISCARRIAGES

To the Editor:—Would a prostatitis in the male be in any way accountable for miscarriages in the female? The prostatitis was gonorrheal in origin. The couple have been married over one year and three miscarriages have occurred in that time, six weeks from the date of the last period. The history of gonorrhea in the husband is about five years in duration and he has had some prostatic trouble in the past six months. There is no syphilis. The wife had a gynecologic examination following the first miscarriage and was informed that she had a retroflexed uterus with varicosities in the broad ligament of the left side. The patient's examination is negative except for this gynecologic examination. Please omit name and city.

M.D., Pennsylvania.

ANSWER.—Prostatitis in the male, especially of gonorrheal origin, may account for miscarriages in the female. The infected semen may set up an endometritis which can prevent the growth of a fertilized ovum within the uterus. In the case cited it is of importance to know what a specimen of the husband's semen looks like. A gonorrheal infection in the male frequently renders him sterile. In spite of the so-called miscarriages in this case, the husband may not ejaculate any spermatozoa at all or only defective ones and in a considerably diminished number. Simply because an interval of six weeks elapsed between the patient's last regular menstrual period and a profuse flow of blood does not signify that the patient had a miscarriage. It not infrequently happens that the menses are delayed for a few days and even two weeks in women who are not pregnant. Even women who believe they have an exact interval of twenty-eight days between the menstrual periods would find that this interval is not as exact as they believe it is were they to keep accurate records of the periods for a year or more. In the case cited, unless a distinct ovum was observed, a diagnosis of pregnancy should not have been made without a microscopic study of the tissue that was expelled. Even if severe cramps were present at the time of the profuse bleedings, this also would not definitely indicate a pregnancy. The retroflexion of the uterus may play a part in the sterility of this couple. In the case cited, therefore, the husband's semen should be carefully examined for the presence of spermatozoa, their number, shape and motility, and for the presence of pus cells and bacteria. The prostatic secretion should also be examined. If the wife has another hemorrhage suggestive of a miscarriage, the expelled tissue should be studied microscopically. If there are no spermatozoa in the semen, the three hemorrhages were not miscarriages. If the husband's spermatozoa are normal but the tissue expelled by the woman did not contain signs of an ovum, her uterus should be elevated and kept in place by a vaginal pessary. Later a tubal patency test may have to be performed. If the patient really had three miscarriages, it is advisable to elevate the uterus and insert a vaginal pessary because occasionally retroflexion of the uterus is the cause of miscarriages.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: New Orleans, May 9. Montreal, Sept. 19. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *General Examination.* New Orleans, May 10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY: New Orleans, May 9. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARKANSAS: *Basic Science.* Little Rock, May 2. Sec., Mr. Louis E. Gebauer, 1002 Donaghey Bldg., Little Rock. *Regular.* Little Rock, May 10-11. Sec., Dr. Sam J. Allbright, Searcy. *Eclectic.* Little Rock, May 10. Sec., Dr. Claude E. Laws, 803½ Garrison Ave., Fort Smith. *Homeopathic.* Little Rock, May 10. Sec., Dr. Allison A. Pringle, Eureka Springs.

IOWA: Iowa City, June 7-9. Dir., Mr. H. W. Grefe, Capitol Building, Des Moines.

KENTUCKY: Louisville, June 8-10. Sec., Dr. A. T. McCormack, 532 W. Main St., Louisville.

MICHIGAN: Ann Arbor and Detroit, June 7-9. Sec., Dr. Nelson McLaughlin, 1010 Maccabee Bldg., Detroit.

NEBRASKA: *Basic Science.* Omaha, May 3-4. *Regular.* Omaha, June 9-11. Dir., Mrs. Clark Perkins, Lincoln.

NEVADA: Carson City, May 2-4. Sec., Dr. Edward E. Hamer, Carson City.

OHIO: Columbus, June 7-10. Sec., Dr. H. M. Platter, 85 E. Gay St., Columbus.

WYOMING: Cheyenne, June 6. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

PREPARATION FOR THE STUDY OF MEDICINE

STUART GRAVES, M.D.
UNIVERSITY, ALA.

In every community the physician has always been looked on as a leader. In ancient times he was priest as well as physician. He dwelt in a temple. In modern times he must still minister to mind as well as to body, even if he does not dwell in a temple. In ancient times his influence depended much on mysticism, superstition and ignorance. In modern times his success and his efficiency depend on his skill in applying science.

How true this is can better be realized by those who will read two classic books. The first is entitled "The Medical Sciences in the German Universities." In it a half century ago Theodor Billroth, the genius of German medical education, laid down the foundation on which our own structure is being reared, largely according to plans projected by Welch and Osler of the original Johns Hopkins medical faculty. The second book is entitled "Experimental Medicine." In it the great French physiologist Claude Barnard clearly established that the physiology of life, based on the physicochemical properties inherent in the cells of animals and plants and in the physicochemical properties of the environment of those cells, constituted, as he said, "the predestined foundation of scientific medicine."

One should read these two books to comprehend most clearly that a modern doctor's education is developed through four fundamental groups of studies. The first is the study of the gross and microscopic structure of the body. The second is the study of the normal functions of the different organs and systems of the body. The third is the study of the pathologic alteration of structure and function which constitutes disease. The fourth is the study of methods for the prevention or cure of disease.

If a prospective medical student can grasp this view of medical education and medical practice, he can appreciate how necessary is a thorough working knowledge of biology, chemistry, physics and mathematics. In order to study these sciences most successfully he must not only be able to express himself clearly and fluently in correct English but he should be able to read also German or French, preferably both, because so much of the best medical literature is recorded in those languages. His premedical foundation must be firmly laid in the natural sciences. This preparation should be broadened by those studies which will help him to understand better how man in the past has improved his physical, mental and ethical self and has learned how to adapt his relationship to his fellow men in such a way as to bring about healthier and happier social interdependence. This view emphasizes the importance of history, language, literature, philosophy, logic, sociology and psychology as well as biology, chemistry, physics and mathematics. Such studies tend to develop a resourceful man, with a mind eager to investigate and to discover truth, sensitive of his responsibility to society, dominated by the highest ethical principles. Such a physician was Osler, the greatest practitioner and medical teacher of the last generation. A third book which every prospective medical student should read with profit is the beautiful biography of Osler, written by Cushing. It will help him to realize the wonderful resourcefulness which a well organized and liberal education brings to a physician.

To conserve health and to cure disease has ever been the problem of the medical profession. In the solution of this problem science has ever found it necessary to struggle against superstition, ignorance, prejudice, dogma, envy, selfishness. To banish these powers of darkness and to give science, through the physician, its greatest opportunity to solve this age-old problem, it is manifest that a medical student must acquire that wisdom and learning which the studies referred to will give him. Observation may reveal little to most men as they walk through the fields of life, but observation by a man trained to recognize things about him will reveal a world of interesting activities all undreamed of by his less fortunate, less educated fellow. Can any one doubt that a young doctor properly trained in chemistry, physics and biology will fail to use his sight, his touch, his smell, his hearing, to their fullest capacity when he comes into the presence of a sick patient? Will there be any danger of a learned man falling back too much on mechanical tests or on the aid of a laboratory technician if he has been educated to see, to feel, to smell, to hear, to investigate by trial and to conclude by reasoning? Will he not use these scientific methods with accuracy and common sense only as aids to his own natural senses? What a sophism is the criticism on modern medical education that it is making doctors automatons and leading them away from the "art" of medicine. Does not such criticism rather spring from a lack of appreciation of the value of scientific procedure? Does it not betray a lack of modern knowledge which links the critic himself with those powers of darkness which are rapidly being conquered?

A common question is, "How long should a student study in college before entering medical school?" That is an important question for all. The answer in general follows:

The records of hundreds of medical students show that those students with only two years of college preparation meet about 20 per cent more failures in medical schools than those with three years of college preparation. Students with three years preparation show only about 2 per cent more failures than those who entered with four years' preparation. So far as these statistics go, therefore, three years in college represents the most desirable period of preparation for those who are limited economically. About half the colleges in the United States offer so-called combination courses which will lead to an arts degree after three years in college and the first year in an approved medical school. An increasing number of medical schools, however, are requiring full four years of academic work for admission.

Radio talk over WAPI, Jan. 22, 1932.

Quantity is not the only consideration, however. Quality is even more important. Other investigations recently have shown quite conclusively that the curve of scholastic grades in premedical courses closely parallels that in subsequent medical courses. Incidentally, personnel investigators for the American Bell Telephone Company and other great industrial corporations have likewise demonstrated that success in business can be predicted with remarkable accuracy on the quality of scholastic records in college. Modern methods are proving that high scholarship is altogether desirable, even from graded school on, and that college students who do well in studies are likely to do well in business as well as in professions. The college man who feels himself qualified to study medicine because he has acquired merely passing grades for the bare legal minimum of sixty semester hours is very likely to fail in medical school. During the last three years the correlation of the medical school records of hundreds of men with their previous college records and aptitude ratings have demonstrated that the student with poor quality of preparation and low intelligence rating has about one chance in ten to graduate. If his aptitude rating falls in the lowest 10 per cent he has practically no chance to reach the junior year in medicine.

Preparation for medicine properly includes also consideration of physical, financial and ethical fitness as well as scholastic training. A strong mind in a strong body forms the most desirable combination. A physician should possess equanimity and imperturbability in the highest degree. And no man should assume the responsibilities of medical practice who does not hold to the highest ethical standards. Honor, honesty, integrity, generosity, self-sacrifice are essential to the finest type of medical practitioner.

The poor boy with the qualifications outlined herein should never hesitate to undertake a medical career. The struggle may be longer and harder, but the dean of every medical school is familiar with many successful physicians who have educated themselves practically without help. Any boy who pleads poverty as a bar to a medical career lacks those very qualities of courage, ambition and intelligence which a doctor needs. Where there is a will there is always a way.

In conclusion, let me emphasize again that a physician should be a leader in his community, and that in the future even more than in the past the leader must be a broadly educated man. As never before in history, the doctor must understand the social relationship of man to man, the psychology which governs society, the history of human endeavor, the literature which contains scientific records, the natural sciences which lead to the great complex science of modern medicine, with its emphasis on preventive medicine and public health. There is no longer the so-called practical doctor as distinguished from the scientific doctor. That doctor is most practical who applies science with common sense and a sympathetic understanding. The "art of medicine" is cultivated by application of science without neglect of those natural senses whose keen development characterized the best of the old physicians. But they were like blind men whose sense of touch becomes extraordinarily sensitive, or like dumb men whose hearing becomes extraordinarily acute. Modern medical science gives us such greatly increased artificial aids that there is sometimes danger of neglecting the development of one's natural senses; and yet the educated physician of today, who is wise enough to prepare himself to utilize both, has a tremendous advantage over the best of the physicians of yesterday.

Modern medical education cannot be imparted to every one; it can be imparted to the best advantage only to persons of good character, fixed purpose, keen native intelligence, disciplined to intense and sustained application. If such persons as these prepare for medical education by laying the foundation of a liberal and scientific education, then their success is assured.

Book Notices

The Diagnosis of Nervous Diseases. By Sir James Purves-Stewart, K.C.M.G., C.B., M.D., Senior Physician to Westminster Hospital, London. Seventh edition. Cloth. Price, $11. Pp. 730, with 312 illustrations. St. Louis: C. V. Mosby Company, 1931.

To its old friends, this excellent textbook needs no commendation. Appearing twenty-five years ago and returning in numerous editions, it has proved a popular and successful reference work for students and practitioners. To the younger element a few words of explanation are in order. Unlike systematic textbooks, this volume presents under each of nineteen heads or leading symptoms the various possibilities to be considered in diagnosis. Some of these headings are delirium, coma, fits and other convulsive phenomena, involuntary movements, aphasia, disorders of articulation, cranial nerves, pain, abnormalities of sensation, and organic motor paralysis of upper and of lower neuron type. Theoretically, and often actually, this arrangement makes it possible to survey a case thoroughly by reading a chapter instead of an entire book. The discussion of separate conditions in each chapter are concise and well proportioned. Heavy type, marking each new subject discussed, is a time-saving feature. The always difficult elements of neurologic anatomy and physiology are well presented in the first two chapters. There are other chapters on methods of case taking, electrodiagnosis, cerebrospinal fluid, and intracranial tumors. The psychoneuroses are briefly considered from a practical standpoint and psychoanalytic theory is accepted only in moderation. The present edition contains new material in its introductory chapters, in the discussion of postural reflexes, intracranial tumors and disorders of sleep, and elsewhere. It is a most useful book and is again welcome.

La folie au XX^e^ siècle: Étude médicosociale. Par le Dr. A. Rodiet, médecin des Asiles de la Seine, et le Dr. G. Heuyer, médecin des Hôpitaux de Paris. Paper. Price, 40 francs. Pp. 359. Paris: Masson & Cie, 1931.

A rather misleading title for a textbook on psychiatry, purporting to compare psychoses and psychoneuroses in Paris before, during and after the war, as to their frequency and forms, with reports of ninety-one clinical cases. The authors find that the alcoholic psychoses, the toxic psychoses from drug addiction (opium, morphine, diacetylmorphine, cocaine) and the cases of simulation have increased, the latter less than one might have expected during the great conflict; but clinical symptoms of all other psychoses and psychoneuroses have been modified by the war, naturally taking their sources from the incidents of that period. To readers who are not French, the great interest of the book resides in the fact that its conception of symptomatology and disease entities radically differs from that of Kraepelin, of Bleuler and of the conception generally accepted in this country in the classification of the American Psychiatric Association; and one can assume that the book is truly representative of the French conception. Little mention is found of the research work and ideas of authors from other countries, and in only a few instances does one encounter the names of Kraepelin, Bleuler, Freud, von Economo or Kahlbaum. The bibliography of sixty-seven authors contains no foreign names, with the exception of Freud (La théorie des névroses: Psychanalyse élémentaire) and of an Italian psychiatrist, Albuno de Cutane. The authors do not accept the nosologic entity of the manic-depressive psychosis and they describe separately the periodic phases and the circular forms. In a short chapter entitled "Schizophrénie," separate from the chapter on dementia praecox, one gains the impression that a different entity is being considered, instead of an attempt by Bleuler at a psychopathologic interpretation of the praecox concept. The paranoid form of dementia praecox, as conceived in this country, or dementia paranoides gravis and mitis of Kraepelin, is included in the "chronic systematized psychoses" (psychoses systématisées chroniques) also under a separate heading. Rodiet and Heuyer excel, as the French do (Sérieux and Capgras, Genil-Perrin and others) in their study and classification of all the paranoid psychoses; the authors describe, according to systematization and frequency of hallucinations, three classes of paranoid psychoses, corresponding in the main to our dementia praecox paranoid, paraphrenias and paranoia. In a special chapter on "automatisme mental" are described

the autochthonous ideas usually associated in most psychiatric textbooks with dementia praecox. The terminology in the whole book differs greatly from the English terminology; for instance, "psychopathies" is a general term for psychoses and psychoneuroses, "délire" means delusional ideas, and this tends to be rather confusing for the reader. In twenty-five pages devoted to the "theories of Freud and psychoanalysis," Rodiet and Heuyer are conservative, definitely circumscribe the use of psychoanalytic treatment, and state that "complexes are symptoms and not essential and primitive causes." In the last chapter, on assistance to the insane in Paris and necessary ameliorations, the authors deplore the congestion of hospitals for mental diseases, the lack of adequate disposition of chronic alcoholic addicts, the absence of the "parole" system ("sortie d'essai") for improved patients, and the lack of proper legislative and material measures for the criminal insane and for the surgical cases among psychotic patients. They would further encourage the use of "familial colonies," adopted in France in 1892 and known in Belgium since the sixteenth century (Gheel): the placing of quiet and inoffensive patients (mostly deteriorated patients with dementia praecox) among families of farmers, under lay as well as medical supervision. The whole book rather stresses the importance of heredity and of the "predisposing constitutional factors" in the etiology of the psychoses and psychoneuroses; opposed as such to the extreme tendency of the present day to emphasize the importance of the psychogenic factors, the book has a decided value, aside from its original racial conception.

Some Phases of Dental Education in the United States. By Alfred Owre, Dean, School of Dental and Oral Surgery, Columbia University. A paper prepared on request for the first Congrès International de l'Association Stomatologique Internationale, Budapest, September 2-7, 1931, and to be published in the Proceedings of the Congrès. Published in this country with permission. Paper. Gratis. Pp. 93. New York: Columbia University School of Dental and Oral Surgery, [n. d.].

This report deals chiefly with the relationship of dental education to medical education and with the vicissitudes of Columbia University in trying to gain recognition for its program. It carries the implication that, in the transformation of dental schools which has been taking place during the last decade, the Dental Educational Council of America has not uniformly stood for high ideals and university standards or always kept clear of the commercial aims which have in many instances carried over from the proprietary school era. Even the exhaustive study undertaken by the Carnegie Foundation for the Advancement of Teaching seems to have failed to clarify the issues completely. A physician gains from this brochure a keener realization of the benefits medical education has derived from its ablest critics, and a greater appreciation of the disinterested leadership which the medical profession has developed from its own ranks.

Praktisches Lehrbuch der Tuberkulose. Von Dr. Hanns Alexander, Leit. Arzt des Sanatoriums Agra (Schweiz), und Sanitätsrat Dr. Gustav Baer, Leit. Arzt der Tuberkulosefürsorgestelle in München. Paper. Price, 36 marks. Pp. 371, with 242 illustrations. Leipzig: Johann Ambrosius Barth, 1931.

Textbooks on tuberculosis have been infrequent in recent years. The purpose of this new work is to outline the advances in treatment and methods of prevention, while covering all knowledge of the pathology, etiology, diagnosis and treatment of tuberculosis. The greater portion of the book deals with pulmonary tuberculosis, yet all forms of extrapulmonary disease are well and fully covered.

Laënnec urged that Latin should be accepted as a universal medical language, and it is indeed unfortunate that when such a splendid work as this is published it should have to await translation to be available to other countries.

With the exception of about forty pages written by Baer on prevention, social problems and the organized effort to control tuberculosis, Alexander is entirely responsible for this masterly work. There is little to criticize and nothing to condemn. The frequency of infection, the route of infection and the morbidity decline are matters illustrated by charts. The pathology and development of pulmonary tuberculosis include the most modern conceptions. Alexander prefers Romer's term of "superinfection" to exogenous reinfection, and "metastasis" to endogenous reinfection. He stresses the development of adult pulmonary disease, and also the spread at times of this condition as due to hematogenous metastasis. The well tried methods of physical examination are not thrown aside for roentgen diagnosis but all must be correctly employed and interpreted. There are nearly 200 roentgen reproductions, chiefly of the chest, and they are of such size and quality that no details are missing. Modern blood examinations are detailed and evaluated, such as the monocyte count, the Schilling tests and the sedimentation methods. The subject of pleurisy is complete and includes illustrations of that rare condition mediastinal pleurisy. But the importance of several years of rest and observation after pleurisy with effusion is not stressed, nor, for that matter, is complete bed rest or postural rest emphasized. The tendency in treatment would seem to be for early surgical compression, although the excellent roentgen illustrations indicate that Alexander well knows the tendency of parenchymatous lung lesions and even cavities to heal completely with bed rest. Baer calls attention to the well known experience that the usual sanatorium treatment leads to an increase in tuberculosis carriers. Early compression therapy therefore is more successful in ridding patients of sputum and making them safer to the community. Alexander considers that upward of 15 per cent of cases of pulmonary tuberculosis are suitable for collapse therapy. Each method, and the reason for it, is carefully described and there are complete descriptions of cases and operations, including bilateral pneumothorax, thoracoplasty, phrenicectomy and other procedures. Thoracoplasty in one stage is preferred, if the conditions warrant. If the operation is in two stages, the lower ribs should be resected first.

Alexander is versatile in his medical therapeutics, in which numerous time-honored remedies may be found. Air baths and sun baths are described and occupational and psychic aids are not neglected. Extrapulmonary tuberculosis, in all its manifestations, is well illustrated and handled. The book should make a valuable addition to the library of every sanatorium in this country.

A Classification for Medical Literature. Compiled by Eileen R. Cunningham, Librarian of the Vanderbilt University Medical Library, Nashville, Tennessee. Leather. Price, $15. Buffalo: Kardex, Division of Remington Rand, Inc., [n. d].

This system, the latest to be added to the several schemes now available for the classification of medical literature, has adopted the Kardex plan for binding. The grouping of the subjects follows a logical scientific arrangement of medical material: first the biologic sciences, next the organic systems of the body, and then the pathologic and clinical subjects. Subjects of general interest, such as biographies, general reference books, sociology and physics, have been grouped in an appendix, indicated with double capital letters. The scheme appears to have been painstakingly developed and probably will find wide usage. The visibility of the general divisions, made possible by the Kardex system, has a distinct advantage. Capital letters are used for the general divisions, and numerals for the first subdivision. This division is subdivided, in turn, by the addition of a second letter (lower case), and this again subdivided by the addition of a numeral. By this method a subdivision of the fourth place can still have a comparatively simple number, e. g., A2a2. An index would have added materially to the value of this classification.

L'acrodynie infantile. Par Ch. Rocaz, médecin honoraire de l'Hôpital des Enfants. Paper. Price, 25 francs. Pp. 95, with 20 illustrations. Paris: G. Doin & Cie, 1932.

This monograph is a distinct contribution to the literature on acrodynia. Its chief value consists in the thoroughness with which the history, etiology, symptoms and pathology are reviewed. After a careful survey of the literature of the epidemic of 1828-1832 and the one commencing in 1903 as reported by Selter, a German physician, to the Congress of Cassel that year, and after careful consideration of the various clinical types of cases described by observers of the disease in the two epidemics, Rocaz agrees with an American student of the subject who in 1920 identified the disease as the same which Chardon had named acrodynia in 1828. He feels, however, that since most of the cases described in the first epidemic were among adults and the great majority in the present epidemic have occurred in children, he prefers to denominate the more recent epidemic as infantile acrodynia. Rocaz describes at

length the various clinical types of acrodynia which have been observed in various parts of the world, each type, however, having been observed and described in some part of the United States. Several of the types described by Rocaz are graphically illustrated. In describing the etiology he inclines to the view that the disease is of infectious origin, although he considers at length its resemblance in many respects to pellagra, which is of food deficiency origin. His discussion of the pathology of the disease consists in reviewing previously published reports. This is true also of the treatment.

Radiologische Praktika. Herausgegeben von Prof. Dr. W. Alwens, Prof. Dr. Fr. Dessauer, und anderen. Band XIX: Die Röntgendiagnostik und -Therapie in der Augenheilkunde. Von Dr. Wolfgang Hoffmann, Oberarzt der Universitäts-Augenklinik Königsberg i. Pr. Cloth. Price, 8.70 marks. Pp. 72, with 20 illustrations. Leipzig: Georg Thieme, 1932.

The roentgenologist and the ophthalmologist speak different languages; consequently, the latter welcomes an a b c translation of roentgenologic procedures in ophthalmology. The author is an ophthalmologist who has had extensive roentgenologic experience and therefore is in a position to evaluate end-results. This is what he proceeds to do without cluttering up the mind of the reader with a mass of technical roentgenologic detail comprehensible only to the x-ray worker. The first part of the booklet is devoted to the roentgenologic localization of foreign bodies in and about the eye. The details of the different methods are given at length and are then evaluated thus: "They all endeavor to localize the position of the foreign body more accurately than operative methods can utilize." In the author's hands, the newer Comberg method of using a marked corneal contact glass with one occipitofrontal and one bitemporal roentgen exposure has proved the simplest and most satisfactory. The diagnostic value of x-rays in other ocular disease is dismissed with a few pages and the remainder of the booklet is given over to roentgen therapy in ophthalmology. Emphasis is laid, of course, on the treatment of various phases of ocular tuberculosis with due regard to protection of the sound eye. Other ocular conditions in which results have been obtained by roentgen therapy are discussed and the experiences of various authors cited. In conclusion there is a complete bibliography in all languages and an easily usable index. The book-making is above the average, as are the illustrations. This book should have a widespread circulation, for it contains practical information that is required almost daily by every ophthalmologist.

Cardiopatías distróficas y esclerosis cardiovascular. Por Doctor Durán Arrom, professor de patología y clínica circulatoria del Instituto de Medicina Práctica. Cloth. Pp. 461, with illustrations. Barcelona: Librería Francisco Sintes, 1931.

The author adequately discusses the clinical and laboratory observations commonly associated with pathologic processes of the heart, aorta and peripheral blood vessels. Statistics for Barcelona in 1928 indicate that deaths from organic heart disease and cerebral apoplexy are much more frequent than deaths from aneurysm, embolism or thrombosis and other disturbances of the circulatory apparatus. The book has three divisions. The first deals with the anatomy, physiology and laboratory examination in cardiac dystrophies. The second deals with the clinical aspects of such dystrophies; aortitis (acute and chronic), aneurysms and arteriosclerosis are also discussed. The third part outlines the prophylactic and therapeutic management of the pathologic processes described.

The Principal Nervous Pathways. By Andrew Theodore Rasmussen, Ph.D., Professor of Neurology, Department of Anatomy, University of Minnesota Medical School. Cloth. Price, $2.50. Pp. 73, with illustrations. New York: Macmillan Company, 1932.

In nine charts and nineteen figures, Rasmussen successfully covers the anatomy of the central nervous system as represented by the motor and sensory conducting systems of nerve fibers. While the subject of nervous pathways is fairly well dealt with in the majority of textbooks on neuro-anatomy, in none is it taken up so comprehensively and conservatively, or so successfully correlated with its physiology. Not only are the usual "long" and "short" pathways discussed, but also such complicated structures as the nerves of hearing, vision and taste, and the extrapyramidal, sympathetic and parasympathetic nerves. This is one of few books that is of equal value to a beginner, a clinical neurologist and even a specialist. The charts and text are clear, the print and the illustrations are excellent. On the whole, it is a valuable and useful treatise.

Medicolegal

Violation of Narcotic Act as "Unprofessional Conduct"

(State ex rel. State Board of Medical Examiners v. Gardner (N. C.), 159, S. E. 8)

Gardner, a licensed physician, was convicted in the United States district court of the western district of North Carolina, Asheville division, of violating the Harrison Narcotic Act. Thereafter the state board of medical examiners of North Carolina instituted proceedings to revoke his license. At the hearing, the board held that Gardner had been guilty of unprofessional conduct in that he had violated the provisions of the act named, as shown by the record of his conviction, and the board thereupon revoked his license.

Gardner appealed to the superior court of Buncombe County. He requested the court to submit to the jury the question whether he *was or was not guilty of the offense* charged in the indictment on which he was tried. This, the court refused to do. It did, however, over Gardner's objection, submit to the jury the question whether Gardner *had or had not been convicted on an indictment* charging him with violating the Harrison Narcotic Act. The jury found that Gardner had been so convicted. On motion made on behalf of Gardner, however, the court, notwithstanding the verdict of the jury, gave judgment in his favor and set aside the order of the board of medical examiners revoking his license. The board and Gardner both thereupon appealed to the Supreme Court of North Carolina.

It should be noted, said the Supreme Court, that the state board of medical examiners has no power to revoke a license to practice medicine on the sole ground that the licentiate has been convicted in a court, federal or state, of a violation of a criminal statute. When a physician has been convicted of violating the laws of North Carolina relative to the prescription, sale or possession of certain narcotic drugs, the revocation of his license is a part of the punishment prescribed by the statute and is included in the judgment of the court, but the state board of medical examiners has no authority with respect to the matter. In the present case, however, the board revoked Gardner's license under the provisions of the statute authorizing revocation *for unprofessional conduct*, in that he had violated the Harrison Narcotic Act as shown by the record of his conviction. The power to determine whether or not Gardner's conduct was unprofessional was vested by law primarily in the board of medical examiners. The conviction of a physician of the violation of a statute, whether federal or state, is not sufficient of itself to justify the revocation of his license by the state board of medical examiners. When, however, that board finds that the violation of the statute, under all the facts and circumstances shown by the evidence before the board, constitutes unprofessional conduct, the board has the authority to revoke the license. Such was the situation in the present case. It is true that the Harrison Narcotic Act was sustained by the United States Supreme Court on the ground that it was a revenue measure, but that does not alter the present situation.

When Gardner appealed to the superior court of Buncombe County, however, he denied that he had violated the Harrison Narcotic Act and that he had been guilty of unprofessional conduct. He was entitled, therefore, to a trial de novo by a jury on the controverted issue of fact. He was entitled to have the jury pass on his guilt or innocence. The order of the board of medical examiners was not made on the ground that Gardner had been convicted of a violation of the Harrison Narcotic Act; it was made on the finding by the board that he had been guilty of unprofessional conduct. Gardner having challenged that finding was entitled to have an issue submitted to the jury involving that controverted fact. The superior court was without authority to render judgment in the proceeding until that issue had been answered by the jury. Gardner was held by the Supreme Court to be entitled, therefore, to a new trial, at which an appropriate issue involving guilt or innocence of the charge that he had been guilty of unprofessional conduct, as specified by the board of medical examiners, should be sub-

mitted to the jury. The burden, said the court, is on the board of medical examiners to show by competent evidence that Gardner has been guilty of unprofessional conduct, in that he violated the Harrison Narcotic Act under circumstances that show him to be unworthy to hold a license to practice medicine in the state of North Carolina.

Award of Workmen's Compensation as Bar to Action for Malpractice

(Revell v. McCaughan (Tenn.), 39 S. W. (2d) 269)

Revell instituted proceedings against his employer and his employer's insurer to recover compensation under the Tennessee workmen's compensation act. He averred that because of an industrial accident his index finger and the first joint of the little finger of his right hand had to be amputated and that because of blood poisoning that occurred as a complication he permanently lost entirely the use of his right hand and right arm. He was awarded compensation. Thereafter he brought this action, charging with malpractice the defendant, the physician who at the instance of his employer treated him when he was injured. Revell admitted that the injury to his finger was the result of the accident. In this action, however, he claimed that the loss of the use of his arm, the pain, and his other injuries were due to the defendant's malpractice. The defendant-physician pleaded that the settlement by the employer in the previous proceedings barred this action by the employee, Revell. The trial court thereupon dismissed the suit and Revell appealed to the Supreme Court of Tennessee.

It appears, said the Supreme Court, that the injuries for which the greater part of the compensation under the workmen's compensation act was awarded were due to the negligence of the physician. They were therefore injuries creating in a person other than the employer—namely, the physician—a legal liability to pay damages. Under such circumstances the workmen's compensation act gave Revell the option of claiming compensation from his employer under the act; or of proceeding at law against the person immediately responsible for his injuries, the physician; or of proceeding at law against both his employer and his physician. The workmen's compensation act, however, expressly provides that a workman situated as Revell was shall not be entitled to collect damages both from his employer and from the third person immediately responsible for his injuries, but that

> "if compensation is awarded under this Act the employer having paid the compensation or having become liable therefor may collect, in his own name or in the name of the injured employee in a suit brought for the purpose, from the other person in whom legal liability for damages exists, the indemnity paid or payable to the injured employee." Pub. Acts, 1919, c. 123.

Revell, having elected to proceed under the workmen's compensation act and having been awarded compensation, was therefore barred from obtaining damages from the physician.

Revell contended, however, that the settlement with his employer could not have included his claim against the physician, citing in support of his contention *Quinn* v. *Railroad*, 94 Tenn. 713, 30 S. W. 1036, in which it was held that an employer who has used reasonable care in the selection of a physician is not liable to his employee for injuries resulting from the negligence of that physician. That case, however, said the court, held that since the physician did not act under the direction and control of the employer, the physician could not be regarded as the employer's agent and that the employer was therefore not responsible for the physician's acts. If one is injured by the negligence of another and his injuries are aggravated by the negligence of a physician, the negligence of the original wrongdoer that made the services of the physician necessary is regarded as the proximate cause of the damage resulting from the physician's negligence. That is true even though the physician is selected by the injured person himself, provided the injured person exercises due care in making his choice. Even if the plaintiff in this case had sued his employer at law, instead of proceeding under the workmen's compensation act, the employer would still have been liable for the result of the medical treatment.

The judgment of the trial court in favor of the physician-defendant was affirmed.

Society Proceedings

COMING MEETINGS

American Medical Association, New Orleans, May 9-13. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Association for the Study of Goiter, Hamilton, Ontario, June 14-16. Dr. J. R. Yung, 670 Cherry St., Terre Haute, Ind., Secretary.

American Association for the Study of the Feeble-Minded, Philadelphia, May 26-29. Dr. Groves B. Smith, Godfrey, Illinois, Secretary.

American Association of Genito-Urinary Surgeons, Niagara Falls, Ontario, Canada, May 26-28. Dr. Henry L. Sanford, 1621 Euclid Avenue, Cleveland, Secretary.

American Association of Pathologists and Bacteriologists, Philadelphia, April 28-29. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.

American Bronchoscopic Society, Atlantic City, May 21. Dr. Richmond McKinney, 899 Madison Avenue, Memphis, Tennessee, Secretary.

American Climatological and Clinical Association, Atlantic City, May 5-7. Dr. Arthur K. Stone, Auburn Street, Framingham Center, Mass., Secretary.

American Dermatological Association, Havana, Cuba, May 3-5. Dr. William H. Guy, 500 Penn Avenue, Pittsburgh, Secretary.

American Gastro-Enterological Association, Atlantic City, May 2-3. Dr. Charles G. Lucas, 307 West Broadway, Louisville, Secretary.

American Gynecological Society, Quebec, May 30-June 1. Dr. Otto H. Schwarz, 630 South Kingshighway, St. Louis, Secretary.

American Heart Association, New Orleans, May 10. Dr. Irl C. Riggin, 450 Seventh Avenue, New York, Executive Secretary.

American Laryngological Association, Atlantic City, May 19-21. Dr. George M. Coates, 1721 Pine Street, Philadelphia, Secretary.

American Laryngological, Rhinological and Otological Society, Atlantic City, May 23-25. Dr. Robert L. Loughran, 33 East 63d Street, New York, Secretary.

American Neurological Association, Atlantic City, June 6-8. Dr. Henry Alsop Riley, 117 East 72d Street, New York, Secretary.

American Orthopedic Association, Toronto, Canada, June 15-18. Dr. DeForest P. Willard, 1916 Spruce Street, Philadelphia, Secretary.

American Otological Society, Atlantic City, May 17-19. Dr. Thomas J. Harris, 104 East 40th Street, New York, Secretary.

American Pediatric Society, Rochester, Minnesota, May 26-28. Dr. Hugh McCulloch, 500 South Kingshighway, St. Louis, Secretary.

American Physiological Society, Philadelphia, April 28-30. Dr. Arno B. Luckhardt, 5216 Greenwood Avenue, Chicago, Secretary.

American Proctologic Society, Memphis, May 6-7. Dr. Curtice Rosser, 710 Medical Arts Building, Dallas, Texas, Secretary.

American Psychiatric Association, Philadelphia, May 30-June 3. Dr. Clarence O. Cheney, 722 West 168th Street, New York, Secretary.

American Society for Clinical Investigation, Atlantic City, May 2. Dr. Cyrus C. Sturgis, Simpson Memorial Institute, Ann Arbor, Mich., Secretary.

American Society for Experimental Pathology, Philadelphia, April 28-30. Dr. C. Phillip Miller, Jr., University of Chicago, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Philadelphia, April 27-30. Dr. V. E. Henderson, University of Toronto, Toronto, Secretary.

American Society of Biological Chemistry, Philadelphia, April 28-30. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Secretary.

American Society of Clinical Pathologists, New Orleans, May 6-9. Dr. A. S. Giordano, 531 North Main Street, South Bend, Ind., Secretary.

American Surgical Association, New Haven, Conn., May 16-18. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.

American Therapeutic Society, Baltimore, May 16-17. Dr. Grafton Tyler Brown, 1801 I Street N.W., Washington, D. C., Secretary.

American Urological Association, Toronto, May 30-June 2. Dr. Gilbert J. Thomas, 1009 Nicollet Avenue, Minneapolis, Secretary.

Association for the Study of Internal Secretions, New Orleans, May 9-10. Dr. F. M. Pottenger, 1930 Wilshire Boulevard, Los Angeles, Secretary.

Association of American Physicians, Atlantic City, May 3-4. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.

California Medical Association, Pasadena, May 2-5. Dr. Emma W. Pope, 450 Sutter Street, San Francisco, Secretary.

Connecticut State Medical Society, New Haven, May 25-26. Dr. Charles W. Comfort, Jr., 27 Elm Street, New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, D. C., May 4-5. Dr. C. B. Conklin, 1718 M Street, N.W., Washington, D. C., Secretary.

Florida Medical Association, Sarasota, May 3-4. Dr. Shaler Richardson, 111 West Adams Street, Jacksonville, Secretary.

Georgia, Medical Association of, Savannah, May 17-20. Dr. Allen H. Bunce, 139 Forrest Avenue N.E., Atlanta, Secretary.

Illinois State Medical Society, Springfield, May 17-19. Dr. Harold M. Camp, 203 Lahl Building, Monmouth, Secretary.

Iowa State Medical Society, Sioux City, May 4-6. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Kansas City, May 3-5. Dr. J. F. Hassig, 804 Huron Building, Kansas City, Secretary.

Louisiana State Medical Society, New Orleans, May 9-10. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.

Maine Medical Association, Rangeley, June 16-18. Dr. Philip W. Davis, 22 Arsenal Street, Portland, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 26-27. Dr. Walter Dent Wise, 4211 Cathedral Street, Baltimore, Secretary.

Massachusetts Medical Society, Boston, June 8-10. Dr. Walter L. Burrage, 182 Walnut Street, Brookline, Secretary.

Medical Women's National Association, New Orleans, May 8-9. Dr. Sylvia Allan, Winthrop College, Rock Hill, S. C., Secretary.

Minnesota State Medical Association, St. Paul, May 23-25. Dr. E. A. Meyerding, 11 West Summit Avenue, St. Paul, Secretary.

Missouri State Medical Association, Jefferson City, May 23-26. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.

National Tuberculosis Association, Colorado Springs, June 6-9. Dr. Charles J. Hatfield, 7th and Lombard Streets, Philadelphia, Secretary.

Nebraska State Medical Association, Lincoln, May 24-26. Dr. R. B. Adams, Center McKinley Building, Lincoln, Secretary.

New Hampshire Medical Society, Manchester, May 17-18. Dr. D. E. Sullivan, 7 North State Street, Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, June 15-17. Dr. J. B. Morrison, 66 Milford Avenue, Newark, Secretary.
New Mexico Medical Society, Santa Fe, May 19-21. Dr. L. B. Cohenour, 219 West Central Avenue, Albuquerque, Secretary.
New York, Medical Society of the State of, Buffalo, May 23-25. Dr. Daniel S. Dougherty, 2 East 103d Street, New York, Secretary.
Ohio State Medical Association, Dayton, May 3-4. Mr. Don K. Martin, 131 East State Street, Columbus, Executive Secretary.
Oklahoma State Medical Association, Tulsa, May 24-26. Dr. Claude A. Thompson, Manhattan Building, Muskogee, Secretary.
Rhode Island Medical Society, Providence, June 2. Dr. J. W. Leech, 369 Broad Street, Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, April 30. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.
Texas, State Medical Association of, Waco, May 5-7. Dr. Holman Taylor, Medical Arts Building, Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Medical Sciences, Philadelphia

183: 153-300 (Feb.) 1932

*Pulmonary Fibrosis: Experiments of Short Duration. W. S. Lemon and G. M. Higgins, Rochester, Minn.—p. 153.
*Benign Tumors of Bronchus. H. Wessler and C. B. Rabin, New York. —p. 164.
Frequent Occurrence of Abnormal Cutaneous Capillaries in Constitutional Neurasthenic States. J. Q. Griffith, Jr., Philadelphia.—p. 180.
*Raynaud's Disease: Critical Review of Minimal Requisites for Diagnosis. E. V. Allen and G. E. Brown, Rochester, Minn.—p. 187.
*Erythremia and Myelogenous Leukemia: Report of Cases Presenting Aspects of Both Diseases. T. G. Klumpp, Cleveland, and A. T. Hertig, Boston.—p. 201.
Pregnancy in Course of Leukemia: Case Report. I. I. Kaplan and J. E. Connery, New York.—p. 209.
*Incidence and Situation of Myocardial Infarction in One Thousand Consecutive Postmortem Examinations. Arlie R. Barnes and R. G. Ball, Rochester, Minn.—p. 215.
*Studies in Complete Heart Block: II. Clinical Analysis of Forty-Three Cases. L. B. Ellis, Boston.—p. 225.
Colonic Administration of Oxygen in Experimental Anoxemia. R. L. Moore and H. W. Cochran, New York.—p. 235.
Studies in Revivification: I. Organization of Resuscitation Measures. J. O. Wanger and S. N. Blackberg, New York.—p. 241.
Significance of Bargen Organism as an Etiologic Factor in Ulcerative Colitis. H. A. Rafsky and P. J. Manheims, New York.—p. 252.
Contribution to Pathogenesis and Heredity of Laurence-Biedl Syndrome (Dystrophia Adiposogenitalis, Retinitis Pigmentosa, Mental Deficiency and Polydactylism): Report of Three Cases in One Family. A. M. Ornsteen, Philadelphia.—p. 256.
Cerebral Adiposity with Nerve Deafness, Mental Deficiency and Genital Dystrophy: Variant of Laurence-Biedl Syndrome. E. Weiss, Philadelphia.—p. 268.

Pulmonary Fibrosis.—Lemon and Higgins believe that the fibrosis of the lungs produced in workers exposed to dusty atmospheres, especially those in which fine particles of silica make up the larger percentage of the dust, is an end-product and represents a progressive defeat of the protective mechanisms of the body. It is never found until the lung fails to rid itself of dust carried out of the bronchi by ciliary action or of dust carried through the lung by way of the lymphatic channels. With the breakdown in the carrying mechanisms, the burden of protection is the phagocytic cell, which, with its load of engulfed material, passes to all parts of the lung and ultimately becomes immobilized in those portions of parenchyma in which lymphatic tissue is abundant. The cells concerned are polymorphonuclear leukocytes, which are the first to appear, to disintegrate and to disappear, and clasmatocytes, which appear later, are extremely active, break up less rapidly, and may become transformed into fibroblasts. In association with the tissue fibroblasts the clasmatocytes form scar tissue. Finally, fibrosis is the result of the action of substances secreted by the cell on the foreign particles. If a tissue poison results from this chemical action, fibrosis is encouraged, and is progressive, lasting as long as the unaltered irritant remains in the lung.

Benign Tumors of Bronchus.—On the basis of a study of seventeen cases, Wessler and Rabin seek to define a clinical picture of benign tumors of the bronchus. Their study was concerned mainly with that form of tumor known as adenoma, which appears to be the commonest type encountered clinically. The following facts are emphasized: 1. Care must be exercised in the microscopic diagnosis of these tumors lest they be mistakenly regarded as malignant. 2. Benign tumors of the bronchus probably have a long period of latency during which there may be no symptoms of bronchial obstruction or bronchial irritation. 3. In a considerable percentage of the cases this period is characterized by repeated hemorrhages. 4. Aside from the symptoms of bronchial obstruction and infection, pulmonary hemorrhage is a frequent symptom of adenoma of the bronchus. This bleeding has certain characteristics which may suggest the diagnosis. 5. When stenosis of a bronchus with infection of a lung has occurred the clinical picture may be confusing. These clinical pictures are described. 6. The prognosis of benign tumors of the bronchus depends on the early discovery and removal of the tumor, which may lead to prompt cure. When secondary inflammatory changes have occurred in the lung, the outlook is not good. 7. Evidence is adduced which indicates that polypoid adenomas may undergo malignant degeneration.

Raynaud's Disease.—Allen and Brown state that Raynaud's requirements for diagnosis of the clinical syndrome which justifiably bears his name are valid and are borne out by their studies of more than 150 cases. These requirements are: (1) Gangrene or trophic changes limited in a large degree to the skin; (2) symmetrical or bilateral involvement; (3) absence of evidence of occlusive lesions of the peripheral arteries, and (4) intermittent attacks of changes in color which usually precede the trophic changes by months or years. Many of the cases reported by Raynaud were not illustrative of the condition described by him, as is usually the case with eponymic diseases described many years ago. They did not fulfil the minimal requirements. The use of these cases as models by many subsequent authors has led to a high percentage of erroneous diagnoses. Study of twenty-five cases reported in the literature as Raynaud's disease shows that none of them fulfils the necessary requirements for such a diagnosis. These cases are characterized by failure to adhere to Raynaud's basic requirements, and inadequacy of examination of patients. Many of the cases are obviously examples of thrombo-angiitis obliterans. The authors emphasize the fact that accurate diagnosis in peripheral vascular disease is essential if treatment is to be properly evaluated.

Erythremia and Myelogenous Leukemia.—Klumpp and Hertig report a case of erythremia presenting a marked leukocytosis, myelocytes in the blood stream, a huge spleen, and terminating fatally following roentgen-ray therapy over the spleen. Four similar cases appearing in the hospital records are reviewed briefly. The authors suggest a classification of cases having the combined picture of polycythemia and leukemia.

Incidence of Myocardial Infarction.—In 1,000 unselected consecutive postmortem examinations more or less localized myocardial infarction was recognized grossly by Barnes and Ball in forty-nine subjects (4.9 per cent). Of 685 of these subjects, 40 years of age or more, myocardial infarction was observed in forty-seven (6.86 per cent). A majority of the subjects who had sustained myocardial infarction had had associated hypertension, as judged by the cardiac weights and the records of blood pressure. Notable preponderance of arteriosclerosis in the left coronary artery over that found in the right was not observed in the hearts in which evidence of infarction was found. Gross myocardial infarction resulting from coronary occlusion was practically confined to the left ventricle. Myocardial infarction was observed in the posterior basal portion of the left ventricle in twenty-four instances as compared with twenty-eight instances in which it involved the apex and anterior portion. More careful pathologic study of the posterior basal portion of the left ventricle is urged in order that infarctions in that region be not overlooked. In twenty-eight instances infarction occurred in the region supplied by the anterior descending branch of the left coronary artery, as compared with twenty instances in which it occurred in the region of the left ventricle supplied by the right coronary artery. The authors believe that

the designation of the anterior descending branch of the left coronary artery as "the artery of coronary occlusion" is no longer justifiable.

Studies in Complete Heart Block.—Ellis presents an analysis of 43 cases of complete auriculoventricular block in patients ranging in age from 9 weeks to 78 years. Seventy per cent of the patients were over 40 years of age and the same percentage were males. In 29 cases the block was permanent, while in the remainder it was intermittent or temporary. Fifty-two per cent of the cases of permanent block were due to arteriosclerosis, 31 per cent were of undetermined origin, but in most of these instances were probably either congenital or dependent on an acute infection. Diphtheria, syphilis and rheumatic infection were responsible for a small number of cases. Digitalis was the chief etiologic agent producing transitory block, although arteriosclerosis and infections caused a lesser proportion. Complete heart block alone may exist for very prolonged periods of time without damaging the health of the patient. Four cases are recorded in which the block is known to have existed for 24, 15, 14 and 7 years, respectively, and 2 more in which it has almost certainly lasted 9 years. The chief factors governing the prognosis appear to be etiology, age, Adams-Stokes seizures, electrocardiographic abnormalities and cardiac size. The significance of arterial blood pressure observations is discussed. Young persons with complete heart block may have essentially normal blood pressures. A systolic arterial hypertension and wide pulse pressure usually occur in heart block in persons giving evidence of peripheral arteriosclerosis.

American Journal of Physiology, Baltimore

99: 521-728 (Feb.) 1932

Combined Effects of Convulsant Agents and Ligation of Head Arteries in Cats. Helen C. Coombs and F. H. Pike, New York.—p. 521.

*Mechanism of Postural Reduction in Vital Capacity in Relation to Orthopnea and Storage of Blood in the Lungs. W. F. Hamilton and A. B. Morgan, Louisville, Ky.—p. 526.

Studies on Circulation: IV. Further Analysis of Injection Method and of Changes in Hemodynamics Under Physiologic and Pathologic Conditions. W. F. Hamilton, H. W. Moore, J. M. Sinsman and R. G. Spurling, Louisville, Ky.—p. 534.

*Effect of Ovarian Substances on Excised Rat Uterus. S. Rosenfeld and E. P. Durrant, Columbus, Ohio.—p. 552.

*Effect of Temperature on Content of Sugar in Blood of Albino Rat. E. W. E. Schear, Columbus, Ohio.—p. 555.

*Further Observations on Normal Variations in Erythrocyte Values in Women. Christianna Smith and Margaret Prest, South Hadley, Mass. —p. 562.

*Effects of Low Alveolar Oxygen and High Alveolar Carbon Dioxide on Rate of Flow of Cerebrospinal Fluid. H. Nicholson, Ann Arbor, Mich.—p. 570.

Normal Period of Submergence for Hippopotamus. G. H. Parker, Boston.—p. 577.

Observations on External Work of Isolated Turtle Heart. L. N. Katz, Chicago.—p. 579.

Effects of Methyl Guanidine Salts on Some of the Autonomic Nerves of the Dog. W. F. Potter and O. O. Stoland, Lawrence, Kan.—p. 598.

Effect of High Frequency Currents on Oxygen Consumption of Frog Muscle. W. O. Fenn and W. B. Latchford, Rochester, N. Y.—p. 608.

Changes in Blood Fat Produced by Fasting, Phlorhizin and Pancreatectomy. H. E. Himwich, W. H. Chambers, A. L. Hunter and M. A. Spiers, New Haven, Conn.—p. 619.

Cerebrospinal Fluid in Normal Dogs. M. A. Perlstein and A. Levinson, Chicago.—p. 626.

Oxygen Usage of Uterine Muscle of the Sow. Jessie L. King, Baltimore.—p. 631.

Studies of Gallbladder Function: IV. Absorption of Chloride from the Bile-Free Gallbladder. I. S. Ravdin, C. G. Johnston, J. H. Austin and Cecilia Riegel, Philadelphia.—p. 638.

Id.: V. Absorption of Calcium from the Bile-Free Gallbladder. C. G. Johnston, I. S. Ravdin, J. H. Austin and J. L. Morrison, Philadelphia.—p. 648.

Id.: VI. Absorption of Bile Salts and Cholesterol from the Bile-Free Gallbladder. Cecilia Riegel, I. S. Ravdin and C. G. Johnston, Philadelphia.—p. 656.

Relation of Sodium, Potassium and Calcium Ions to Heart Rhythmicity. A. M. Baetjer and C. H. McDonald, Baltimore.—p. 666.

Physiologic Action of Venom of Water Moccasin (Agkistrodon Piscivorus). H. E. Essex, Rochester, Minn.—p. 681.

Specificity of Immunity to Venom of Rattlesnake as Indicated by Injections of Venom of Water Moccasin and Honey Bee. H. E. Essex, Rochester, Minn.—p. 685.

*Studies in Physiology of Vitamins: XVII. Effect of Thyroid Administration on Anorexia Characteristic of Lack of Undifferentiated Vitamin B. H. E. Himwich, W. Goldfarb and G. R. Cowgill, New Haven, Conn.—p. 689.

Observations on Flow of Blood of Kidney. J. F. Herrick, H. E. Essex and E. J. Baldes, Rochester, Minn.—p. 696.

Accumulation of Lactic Acid in Excised Brain, Kidney, Muscle and Testicle. J. Haldi, Ann Arbor, Mich.—p. 702.

*Effect of Adrenal Cortical Hormone on Respiratory Metabolism of Cat. B. Webster, J. J. Pfiffner and W. W. Swingle, New York.—p. 710.

Postural Reduction in Vital Capacity.—Hamilton and Morgan present evidence that while the vital capacity decreases when one assumes the recumbent posture, the residual air remains constant. In the completely inspired position the size of the chest may increase in the recumbent posture. It would seem, therefore, that the lungs serve as storage for blood which is poured out of the dependent veins when one lies down. This conception is substantiated by the fact that when blood pressure cuffs are applied to the four extremities, and blood trapped in the arms and legs by raising the pressure in the cuffs to diastolic, there is a prompt and marked increase in the recumbent vital capacity, so that it may equal or exceed the vital capacity in the standing posture.

Effect of Ovarian Substances on Excised Rat Uterus.—Rosenfeld and Durrant studied the action of different sex hormone preparations on the spontaneous rhythmic contractions of excised rat uteri. It was found that all ovarian tissue preparations possess inhibitory action on the rate and rhythm of these contractions while those sex hormone preparations not prepared from the ovary were without action.

Environmental Temperature and Blood Sugar of Rat.—According to Schear, the concentration of sugar in the blood of the albino rat varies materially as the environmental temperature changes. These two factors stand in an inverse relation to each other, as the temperature is lowered the blood sugar level rises; when the temperature is high the level of sugar is lowered. These changes obtain even within temperature limits which have no effect on the body temperature. The changes appear to be permanent, no readjustments occurring within three weeks, and they are probably in some way related to the metabolic readjustments necessary to meet the requirements of the animal under the changed conditions. The consumption of food is much greater when the animals are subjected to the cold environment, while the water used is less; while on the other hand, under abnormally warm conditions the consumption of food is much less and that of water much greater. It appears that under the low temperature the increased heat requirement is met by the mobilization of a larger quantity of sugar and that this increased metabolic action in the various tissues is accompanied by a high sugar level. On the other hand, under the high temperature the heat requirements of the body are greatly reduced and less sugar is mobilized and a lower level is maintained.

Normal Variations of Erythrocyte Values in Women.—Smith and Prest studied two groups of subjects, the first having a normal and the second, a lower number of erythrocytes. The total number of cells, total hemoglobin content and total volume per cent were significantly higher in the normal than in the low groups, but the estimated mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration remained constant. There were no significant diurnal variations in total number of cells, total hemoglobin content, total cell volume, estimated mean corpuscular hemoglobin concentration.

Alveolar Oxygen and Carbon Dioxide and Cerebrospinal Fluid.—Nicholson reports on the effects of administration of gaseous mixtures high in carbon dioxide and low in oxygen on the rate of flow of cerebrospinal fluid of the dog. High carbon dioxide mixtures whether administered with the ventilation under physiologic control or with constant artificial ventilation caused a decided increase in the rate of flow of cerebrospinal fluid. With normal ventilation low oxygen caused a marked decrease in the flow of cerebrospinal fluid followed in prolonged administrations by an increase approaching the normal rate. With constant artificial ventilation low oxygen caused an increase in the flow of cerebrospinal fluid. The author believes that the changes in flow which he observed are due primarily to changes in the rate of formation of the fluid, though realizing that they may be complicated by other factors. The fact that the flow of cerebrospinal fluid in its response to the administration of these gases resembles salivary secretion but differs from lymph flow suggests a secretory mechanism of formation of the fluid. The author suggests an explanation of these changes in flow on the basis of changes in acidity of the cells of the choroid plexus, assuming that increasing acidity increases the rate of formation of cerebrospinal fluid, and vice versa.

Relationship of Vitamin B to Metabolism.—Himwich and his associates determined the time required for development of the anorexia characteristic of vitamin B deficiency, and the amount of food ingested during the period of voluntary food intake in four dogs under "normal" or basal conditions and during experimental hyperthyroidism. It was found that during hyperthyroidism (1) anorexia appeared in from one half to two thirds of the time required during the control period; and (2) the quantity of food ingested voluntarily per day was correspondingly increased. The total caloric intakes for the two experimental periods were approximately the same. This suggests that a definite relationship exists between a given amount of vitamin B and the catabolism of a definite quantity of foodstuffs. The four animals successfully maintained their weights by voluntary ingestion of food only when receiving sufficient amounts of vitamin B.

Suprarenal Cortical Hormone and Respiratory Metabolism.—Webster and his associates made an attempt to determine the rôle of the suprarenal cortex in the regulation of respiratory metabolism. Following bilateral suprarenalectomy in cats, there was a maximum fall of approximately 50 per cent in metabolism. The administration of suprarenal cortical hormone to these animals caused the respiratory metabolism to return to normal in from twenty-four to forty-eight hours. This change occurred also in animals which had been subjected to total thyroidectomy prior to the beginning of the experiment. Subcutaneous injection of large amounts of suprarenal cortical hormone was not found to affect the respiratory metabolism of normal cats or rabbits. Similar quantities of the hormone, when injected into the thyroidectomized cats, caused an increase in metabolism of from 15 to 30 per cent in 80 per cent of the cases. It would appear that the suprarenal cortical hormone exerts an influence, either direct or indirect, on the mechanism of respiratory metabolism and that this effect can occur independently of the thyroid.

American Review of Tuberculosis, New York

25: 153-284 (Feb.) 1932

*Cellular Studies in Tuberculosis. Florence R. Sabin, New York.—p. 153.
Monocytic Reaction in Tuberculosis. R. Gottlieb, Montreal, Que.—p. 172.
*Behavior of Monocytes in Tuberculosis in Children. W. A. Reilly, San Francisco.—p. 178.
*Study of Laryngeal Effects of Collapse Therapy in Laryngopulmonary Tuberculosis. A. T. Cooper and O. O. Benson, Denver.—p. 186.
*Intrapleural Pressure Changes During Phrenicectomy in Patients with Artificial Pneumothorax. C. Haight and J. K. Deegan, New Haven, Conn.—p. 197.
Spontaneous Pneumothorax on Left Side with Simultaneous Pneumonia on Right. E. Tolstoi and Doreen R. Corke, New York.—p. 207.
*Study of Tuberculous Infection by Way of Female Genital Tract. E. M. Jameson, Saranac Lake, N. Y.—p. 213.
Comparative Study of Pirquet and Mantoux Tuberculin Tests in School Children. S. A. Slater and Kathleen Jordan, Worthington, Minn.—p. 218.
Effect of Mechanical Grinding on Tubercle Bacilli. H. S. Willis, Northville, Mich.—p. 224.
Relation of Toxicity in Pulmonary Tuberculosis to Diffusible-Nondiffusible Calcium Ratio. J. D. Booth, Lake Kushaqua, N. Y., and A. S. Broga, Sunmount, N. Y.—p. 231.
Lesions of Peripheral Blood Vessels in Pulmonary Tuberculosis. R. T. Ellison, Philadelphia.—p. 237.
*Recurrent Winter Cough: Its Pathogenesis. J. Harkavy, New York.—p. 244.
Treatment of Pulmonary Tuberculosis by Gold and Copper Salts: Preliminary Note on Intracavitary Treatment. A. MacDowell, Rio de Janeiro, Brazil.—p. 252.

Cellular Studies in Tuberculosis.—According to Sabin, recent methods for studying living cells of blood and connective tissues have opened up a new period in experimental pathology, and the growing realization of the importance of cellular reactions to immunity makes these developments timely. The first studies of this new period were made with the so-called vital staining of cells in which certain dyes were repeatedly injected into the living animal. Analysis of this material demonstrated that such dyes as were effective reached the cells in the form of particulate matter and therefore were a gage of phagocytic activity. The dyes used in the supravital technic have a more complex reaction. They are applied to living cells which have been taken from the body and thus the method is allied to that of tissue culture. The advantage of the supravital technic to experimental pathology consists in the fact that the survey of the living cells of the connective tissues can be made at necropsy and more data obtained concerning specific cellular responses to pathologic agents than is visible in sections. In the study of fresh scrapings made from tuberculous lymph nodes of man and from the early lesions in experimental tuberculosis in rabbits, it appears that the typical epithelioid cell is a modified monocyte. The living epithelioid cell is characterized by a large rosette, occupying the center of the cell, and thus accentuating the position of the centrosphere; this rosette is made up of the same type of vacuoles that characterize the monocyte but they are reduced in size and at the same time are vastly increased in number. These observations led to a restudy of the cells of the blood throughout the whole course of experimental tuberculosis.

Behavior of Monocytes in Tuberculosis in Children.—Reilly studied thirty-two tuberculous and five nontuberculous girls by Sabin's supravital blood-staining technic for monocytes from May until October with repeated examinations. The patients had mainly hilar node lesions. Percentages and actual numbers of lymphocytes and monocytes were computed. A comparison was afforded by simultaneous Wright's staining, which is inferior in picking out monocytes. In clinically active tuberculosis the results of supravital staining, as judged by the ratio of monocytes and actual numbers of monocytes, corroborated this clinical impression of activity in 62.5 per cent of the patients. The ratio of monocytes to lymphocytes corroborated the impression of clinical inactivity in 92.3 per cent of the patients, while the actual number of cells corroborated this impression in only 76.9 per cent. The method is somewhat tedious and time consuming, and not practical except for a large number of patients. Results confirm the observation that in active tuberculosis the monocytes increase in number and the lymphocytes decrease, while the reverse holds true when inactivity sets in.

Laryngeal Effects of Collapse Therapy in Laryngopulmonary Tuberculosis.—Cooper and Benson studied 106 cases of laryngopulmonary tuberculosis over a period of from six months to six years, to determine the effect of pulmonary collapse therapy on the laryngitis. Eighty, or 75.4 per cent, of the patients were suffering from far advanced pulmonary tuberculosis. Of the total number of these cases, 106, there was demonstrable improvement in the larynx in forty-three cases, or 40.6 per cent, while sixty-three, or 59.4 per cent, showed no such improvement. In a study of the results obtained after thoracoplasty, phrenic exeresis or pneumothorax it appeared that, on the whole, improvement in the pulmonary lesions was closely dependent on the degree to which the collapse therapy was satisfactory and that pulmonary improvement was paralleled by laryngeal improvement. In practically every patient, collapse therapy was instituted because of cavitation or progressive pulmonary tuberculosis. Laryngeal improvement occurred in a greater number of patients than showed either a satisfactory collapse or demonstrable improvement in the pulmonary lesions. Forty-three per cent showed laryngeal improvement and only 33.9 per cent improvement in the pulmonary condition. This may have been due to a lessening of cough and expectoration with its resultant diminution in trauma of the larynx, even in a collapse not considered wholly satisfactory. It is noteworthy that 71.8 per cent of the patients with a satisfactory collapse had clearing of the laryngeal lesions, while only 28 per cent of the cases with an unsatisfactory collapse showed such improvement. It appears to the authors that collapse therapy in laryngopulmonary tuberculosis is a valuable procedure. Many of the patients classified as "far advanced" can be greatly aided; life may be prolonged, distressing symptoms alleviated and, in many cases, the course of the disease changed from steady progression to one of improvement and healing. Tuberculous laryngitis is, as a rule, secondary to tuberculosis elsewhere, usually in the lungs, and its evolution closely parallels that of the pulmonary lesion. The prognosis of this complication remains grave because it supervenes in the more advanced stages of the disease. Not only will the institution of a satisfactory pulmonary collapse of the diseased lung in laryngopulmonary tuberculosis benefit the pulmonary tuberculosis, but the tuberculous laryngitis tends to improve, and quite frequently the lesions in the larynx can be used as a reliable index as to the progression of tuberculosis elsewhere in the body.

Intrapleural Pressure Changes During Phrenicectomy.—Haight and Deegan report observations of the intrapleural pressure changes occurring during phrenicectomy in seven

patients with pulmonary tuberculosis and artificial pneumothorax. An increase in the mean intrapleural pressure followed interruption of the phrenic nerve in six of the seven cases studied. The average increase in the mean pressure was 2.4 cm. of water. No change in the mean pressure occurred in one patient with pneumothorax complicated by pleural effusion. Contributory factors, such as a previous displacement of the mediastinum, a freely movable mediastinum, herniation of the mediastinum, and a portion of collapsible lung, did not prevent the increase in the intrapleural pressure. Pleural effusion, on the other hand, may possibly be a factor in preventing the rise in the intrapleural pressure during phrenicectomy.

Tuberculous Infection by Way of Female Genital Tract.—Jameson inserted small cotton pledgets containing a known amount of a suspension of R1 tubercle bacilli into the vaginas of eleven healthy virginal guinea-pigs and allowed them to remain from four to eight days. Ten of the animals thus treated showed a positive intracutaneous tuberculin reaction at the end of eighty-seven days. Tuberculous lesions were demonstrated in the lymph nodes of six animals on postmortem examination at the end of 100 days and one of them showed tubercles in the genitalia. There was no difference in the number of takes secured in animals inoculated during the estrum or during the resting stage. Many of the animals showed changes in the endometrium and ovaries which may be attributed to the tuberculous infection. Ascending tuberculous infection by way of the female genital tract was produced in eleven of twelve animals inoculated by the vagina although tuberculous lesions were found in only 50 per cent of these.

Recurrent Winter Cough.—Studies made by Harkavy of respiratory infections following influenza, in thirteen cases, point to a frequent simultaneous involvement of the upper (sinuses) and lower respiratory tract. The lesions in the lungs are characterized by bronchiolitis, unresolved pneumonia and bronchiectasis. Delayed resolution of pneumonic infiltrations is partly dependent on the persistence of the chronic infection in the sinuses and adenoids. Improvement, characterized by disappearance of pulmonary signs and clinical symptoms, followed nonsurgical treatment of the sinuses in most of the cases but not in those presenting bronchiectasis. The prognosis depends on the early detection and treatment of foci of infection in the upper respiratory tract (sinuses, infected adenoids, and so on), which must be eradicated in order to prevent chronic progressive changes characterized by hyperplastic sinusitis, pulmonary fibrosis and bronchiectasis. Treatment at this late stage is difficult and unsatisfactory. Changes of climate to dry and warm localities, such as Arizona, decrease the likelihood of recurrences. When an allergic component exists, in the form of protein hypersensitiveness, this must be eliminated before complete therapeutic results may be obtained.

Archives of Neurology and Psychiatry, Chicago

27: 249-488 (Feb.) 1932

*Tumors of Basal Ganglions. F. Ody, Geneva, Switzerland.—p. 249.
Primary Fibroblastoma of Brain. B. J. Alpers, J. C. Yaskin and F. C. Grant, Philadelphia.—p. 270.
*Rôle of Sympathetic Nervous System in Production of Pain in Head. L. Davis and L. J. Pollock, Chicago.—p. 282.
*Lead Poisoning in Children: Cerebral Manifestations. C. F. McKhann, Boston.—p. 294.
*Alterations in Structure of Sella Turcica, as Revealed by Roentgen Ray. K. Kornblum, Philadelphia.—p. 305.
Neuritis from Arsenic and Lead: Significance of Chemical Studies in Diagnosis. W. D. Shelden, J. B. Doyle and A. E. Osterberg, Rochester, Minn.—p. 322.
Blood Pressure in Schizophrenia. H. Freeman, R. G. Hoskins and F. H. Sleeper, Worcester, Mass.—p. 333.
Psycholeptic Attack in Psychoses. W. Muncie, Baltimore.—p. 352.
Blood Lipase, Diastase and Esterase in Multiple Sclerosis: Possible Index of Liver Dysfunction. L. A. Crandall, Jr., and I. S. Cherry, Chicago.—p. 367.
*Serologic Study of Multiple Sclerosis. A. Weil and D. A. Cleveland, Chicago.—p. 375.
*Atypical Diffuse Sclerosis. K. Löwenberg, Ann Arbor, Mich., and M. Fulstow, Boston.—p. 389.
*Hydrocephalus: Report of Case in an Infant with Vestiges of Choroid Plexus in Fourth Ventricle Only. G. B. Hassin, Chicago.—p. 406.

Tumors of Basal Ganglions. — Contrary to generally accepted opinion, and also contrary to the conclusions of Mingazzini and others who, on the basis of cases of tumor of the corpus striatum, have reported that they have established or confirmed a definite lenticular syndrome, twenty-five cases of tumor of the basal ganglions discussed by Ody did not present any specific signs. Most of the symptoms, which were apparently characteristic of a disorder of this region, were nothing but manifestations of a partial decerebration. Whether the latter is due to a mesencephalic transection by the tumor or to an inhibition of the telencephalon by secondary hydrocephalus, one must keep in mind that such a condition may also be encountered in basal meningitis, in cerebellar lesions, in pinealomas, in intraventricular hemorrhages and in ruptured abscesses. Furthermore, similar symptoms have been observed in Cushing's clinic by the author in such cases as a large meningioma of the olfactory groove and an extensive craniopharyngioma in a child. Since symptoms of decerebration were present in only two of the entire series of cases reported, they must be considered to be rather an exception. The absence of any characteristic symptoms for lesions of the basal ganglions may explain the fact that in none of the cases reported was a diagnosis made of involvement or destruction of the basal ganglions. Specific focal signs indicating a condition of the basal ganglions were not apparent from the study of this series of cases.

Rôle of Sympathetic Nervous System in Production of Pain in Head.—Davis and Pollock describe experiments in which they demonstrated that stimulation of the superior cervical sympathetic ganglion produces pain in animals. The appreciation of this pain is effected by the stimulation of efferent sympathetic fibers, the results of which in turn stimulate ordinary accepted sensory pathways in the cranial nerves. The authors present further evidence that there are no antidromic sensory fibers in the cervical spinal anterior roots.

Lead Poisoning in Children.—According to McKhann, lead poisoning in children produces a severe and dangerous form of cerebral involvement in which the symptoms apparently are dependent on the development of an extreme cerebral edema. Less frequently there is encountered the peripheral neuritis commonly observed in adults with lead poisoning. Children who survive a severe lead encephalitis are frequently left with permanent neurologic disorders. The early diagnosis of lead poisoning based on a carefully taken history and physical examination, confirmed by roentgenologic and laboratory data, should lead to the institution of active therapy, which may result in the prevention of the development of serious neurologic manifestations. In the presence of the acute, severe cerebral manifestations, attention must be directed toward the control of greatly increased intracranial tension.

Alterations in Structure of Sella Turcica.—Kornblum has found that alterations in the structure of the sella turcica, as revealed by the roentgen ray, are in a high percentage of cases indicative of intracranial disease. Lesions capable of producing changes in the sella turcica may be classified according to the characteristics of the changes produced, these changes being dependent on the location of the lesion. Deformations of the sella are, in themselves, rarely diagnostic, but when correlated with other roentgenologic observations in the skull, as well as with the clinical manifestations, they offer valuable aid in the localization of suspected intracranial lesions.

Serologic Study of Multiple Sclerosis. — In twenty-six cases of multiple sclerosis, Weil and Cleveland studied the influence of the patient's serum on the spinal cord of the rat. In agreement with Brickner's experiments with plasma of patients with multiple sclerosis, it was found that a larger number of serums from cases of multiple sclerosis than of normal serums acted destructively on the spinal cords of rats. Such action, however, could also be demonstrated in serums from other diseases, and the difference did not seem to be large enough to warrant the drawing of conclusions as to the importance of increase in lipase in the etiology of multiple sclerosis. Furthermore, experiments with active pancreas lipase on the spinal cords of rats gave a negative result. The amount of inorganic phosphorus in the serum of patients with multiple sclerosis was 3.4 mg. per hundred cubic centimeters on the average as compared with 4 mg. in normal cases, 4.2 mg. in twenty-one cases of eight different diseases and 4.4 mg. in cases of syphilis of the central nervous system. In 40 per cent of the cases of multiple sclerosis the inorganic phosphorus of the serum was below 3.3 mg., and in 65 per cent it was 3.5 mg. or less.

Atypical Diffuse Sclerosis. — Löwenberg and Fulstow describe a peculiar mental disease of approximately eleven years'

duration associated with progressive muscle atrophies. Pathologico-anatomically, the principal feature was a destruction of the white matter in both cerebral and cerebellar hemispheres without distortion of the brain. The destroyed myelin was replaced by peculiar glial tissue, which in the later stages was penetrated by connective tissue fibers and finally underwent hyaline degeneration. The cortical gray matter was only occasionally affected. The cerebellar parenchyma was severely affected. The leptomeninges of the cerebellum were in many places hyalinized, and the meningovascular barrier was broken down. The authors discuss the relation of the case to diffuse sclerosis and dysplastic disturbances of the glia.

Hydrocephalus.—Hassin states that hydrocephalus may occur not only in cases in which the choroid plexus is deficient but also in those in which it is entirely obliterated by an infectious process. The histologic changes in such cases of hydrocephalus may differ somewhat from those in ordinary cases in which the cause of the obstruction is at the base of the brain. In a case reported by the author, hydrocephalus was associated with marked ependymal and subependymal lesions which were not the cause of the hydrocephalus but, like the latter, were due to an obstruction. Such cases furnish additional proof that the spinal fluid does not originate from the choroid plexus.

Archives of Otolaryngology, Chicago

15: 165-338 (Feb.) 1932

Bronchial Asthma: Clinical Studies and Observations in Three Hundred and Fourteen Cases. W. O. Smith, Cleveland.—p. 165.
*Bacteriostatic Properties of Secretions of Sinuses. C. S. Linton, St. Louis.—p. 190.
Perennial Hay Fever. G. T. Brown, Washington, D. C.—p. 202.
*Has Tic Douloureux a Definite Etiology? C. W. Ellis, Lansing, Mich. —p. 218.
*Differential Diagnosis and Therapy of Atrophic Rhinitis and Ozena. S. G. Ruskin, New York.—p. 222.
An Exostosis Causing Pressure Erosion and Ankylosis of Stapes. Dorothy Wolff, St. Louis.—p. 258.
*Pathologic Lesions of Posterior Turbinate Tips: Improved Technic for Their Removal. E. F. Ziegelman, San Francisco.—p. 261.
Atelectasis Following Aspiration of Pecans. J. A. Flynn, Washington, D. C.—p. 268.
Mucosa of Maxillary Sinus of Rabbit: Effect of Acidosis and Alkalosis on Changes in Ciliated Epithelium and Eosinophilic Infiltration Produced by Calcium Precipitating Substances. W. F. Wenner and P. K. Nemours, St. Louis.—p. 270.

Bacteriostatic Properties of Secretions of Sinuses.—Linton describes experiments in which he demonstrated that secretions from the sinuses of rabbits possess an appreciable antibacterial effect, in the first few hours, on lysozyme-soluble bacterium A_3 isolated from the air. Later, through interference with the inhibitory activity or development of resistance, a rapid multiplication occurs. There was little or no inhibitory effect of the secretions from the sinuses of dogs on bacterium A_3. In fact, a moderate growth and multiplication was supported by these secretions when they were used as the sole source of nutriment. Such growth was not supported by the secretions of rabbits under the same conditions. The results indicate that a variation may be expected in the antibacterial effects of the secretions from the sinuses of different species.

Etiology of Tic Douloureux.—Ellis believes that there is a definite asymptomatic maxillary sinusitis with negative roentgen observations, brilliant transillumination, no pus in the nose and no nasopharyngeal catarrh. In eight consecutive cases of tic douloureux observed by him the sinuses were macroscopically identical; that is, they all contained polypi. The pathologic microscopic reports on material removed were also identical and agreed with the macroscopic observations. Eight consecutive cases with constant pathologic processes in the maxillary antrum of the affected side prove nothing, but their occurrence at least demands a careful scrutiny in all major neuralgias in which there is the possibility of a definite etiology in the sinus. It seems impossible that a disease as severe as tic douloureux has no pathologic causation. The author calls attention to the fact that the neuralgia may be due to a toxic condition of the sinus contents or to pressure on the exposed nerve of the second division through a dehiscence.

Atrophic Rhinitis and Ozena.—Ruskin considers that atrophic rhinitis and ozena are two separate and distinct diseases. Ozena is pathologically an obliterating endarteritis of the nasal mucosa. Atrophic rhinitis is the result of a chronic inflammatory disease characterized by round cell infiltration, probably secondary to severe rhinitis. Ozena can be improved by blocking of the vasoconstrictor fibers at the nasal ganglion. Atrophic rhinitis must be treated along nonspecific lines, such as are used in chronic infections.

Lesions of Posterior Turbinate Tips.—According to Ziegelman, pathologic changes in the posterior turbinate tip constitute a definite clinical entity. They cause distressing symptoms at times. The posterior tip of the inferior turbinate is usually the one involved. The important diagnostic symptom of disturbed breathing in one or in both nostrils a few minutes after retiring is almost pathognomonic of a pathologic lesion of the posterior turbinate tip. The only rational treatment is surgical removal. Removal can be effected safely and efficiently with an ordinary nasal snare by using a technic described by the author. The sphenopalatine artery and its branches must always be kept in mind both in the injection of procaine hydrochloride solution and in the use of the snare. Other nasal and paranasal pathologic conditions must be remedied to insure a permanent result.

Florida Medical Association Journal, Jacksonville

18: 355-396 (Feb.) 1932

Tonsillectomies, with Review of One Hundred and Thirty-Four Cases. J. N. McLane, Pensacola.—p. 363.
Use and Abuse of Viosterol (Irradiated Ergosterol) in Florida. W. Quillian, Coral Gables.—p. 366.
Malignant Malaria Fever, Causative Factor in Hemorrhage of the New-Born: Report of Cases. J. G. Gainey, Quincy.—p. 369.
Progress in Pediatrics: (Few Advances Emphasized Recently at Harvard.) W. W. McKibben, Miami.—p. 371.
Repair of Spina Bifida (Meningomyelocele) Under Spinal Anesthesia: Case Report. J. M. Hoffman, Pensacola.—p. 376.

Journal of Thoracic Surgery, St. Louis

1: 225-338 (Feb.) 1932

*Intrathoracic Sympathectomy for Relief of Referred Pain. E. F. Butler, Elmira, N. Y.—p. 225.
Recent Advances in Our Knowledge of Autonomic Nervous System. P. Heinbecker, St. Louis.—p. 233.
*Factors Altering Intrapleural Pressure and Their Clinical Significance. S. Brill, M. Prinzmetal and H. Brunn, San Francisco.—p. 243.
Bronchial Stenosis. L. Eloesser, San Francisco.—p. 270.
Bronchiectasis: II. Clinical Features and Diagnosis. H. Ballon, J. J. Singer and E. A. Graham, St. Louis. —p. 296.

Intrathoracic Sympathectomy for Relief of Referred Pain.—Butler states that thoracic pain, in the absence of definite pathologic changes within the thorax or of the nerves or bones, may be due to a sympathetic viscerosensory reflex. If so, interruption of the reflex arc will relieve the pain. Complete unilateral removal of the fourth, fifth, sixth and seventh dorsal ganglions together with section of the corresponding rami and the origin of the greater splanchnic nerve is not incompatible with life, nor did it cause disability in a case reported by the author. Posterior, extrapleural exploratory thoracotomy affords the optimal surgical approach to the thoracic portion of the sympathetic chain, provided only that it be carried out in accordance with the recognized principles of thoracic surgery.

Factors Altering Intrapleural Pressure.—Brill and his associates call attention to the fact that normal intrapleural pressure is subatmospheric. The administration of bronchodilating drugs, such as epinephrine and atropine, is followed by an increase in the mean intrapleural pressure and decrease in the mean thoracic girth. After bronchoconstricting drugs, such as pilocarpine and physostigmine, there is a decrease in the mean intrapleural pressure and an increase in the mean thoracic girth. Carbon dioxide inhalations are followed by a more negative intrapleural pressure than exists normally, accompanied by an increase in the mean thoracic girth. The changes in intrapleural pressure following the administration of bronchoconstricting and bronchodilating drugs may be the result of the increased or decreased resistance to the passage of air through the bronchi or the result of changes in the alveolar and blood carbon dioxide tension, which in turn cause changes in thoracic girth and intrapleural pressure. The authors' observations of the effects on intrapleural pressure of carbon dioxide inhalations lend further support to its use as a prophylactic and therapeutic agent in postoperative pulmonary complications. Anoxemia is followed by a steadily decreasing intra-

pleural pressure which is coincident with increase in the mean thoracic girth. The effect is even more marked than that following carbon dioxide inhalations. Experimental surgical procedures, such as pressure on the abdomen, administration of ether, opening of the abdomen, traction on the stomach, and evisceration, were followed by an increase in the intrapleural pressure and an increase in the mean thoracic girth. Such procedures place the respiratory mechanism under a handicap, but the untoward effects may be counteracted in part by carbon dioxide inhalations.

Kentucky Medical Journal, Bowling Green

30: 45-100 (Feb.) 1932

Gastro-Intestinal and Biliary Tract Symposium: Clinical and Surgical Aspects of Diseases of Biliary Tract. F. M. Massie, Lexington. —p. 47.
Clinical and Surgical Aspects of Diseases of Duodenum. M. Thompson, Louisville.—p. 49.
Clinical and Surgical Aspects of Diseases of Stomach. R. P. Ball, Harlan.—p. 52.
Injection Treatment of Hemorrhoids. W. H. Mason, Murray.—p. 59.
Study of Some Phases of Dyspnea: Case Report. J. D. Williams, Ashland.—p. 64.
So-Called Modern Urinary Antiseptics. C. G. Hoffman, Louisville. —p. 67.
Symposium on Latent Syphilis: Pathology of Latent Syphilis. A. J. Miller, Louisville.—p. 70.
Diagnosis of Latent Syphilis. C. B. Willmott, Louisville.—p. 72.
Treatment of Latent Syphilis. C. E. Gaupin, Louisville.—p. 74.
Phytobezoar. W. S. Wyatt, Lexington.—p. 79.
Chronic Deforming Arthritis: Treatment by Sympathetic Ganglionectomy. R. G. Spurling and F. Jelsma, Louisville.—p. 80.
Chronic Meningococcic Meningitis. C. B. Stacy, Pineville.—p. 83.
Benign, Hydatid or Vesicular Mole. C. Norfleet, Somerset.—p. 84.
Lung Abscesses. L. W. Frank, Louisville.—p. 85.
Bladder Atony: Sphincter Vesicae Relaxation: An Efficient Remedy and Measure of Prevention in Man. L. L. Solomon, Louisville.—p. 91.
Whooping Cough with Unusually High Leukocytosis. W. W. Nicholson, Louisville.—p. 92.
Thrombosis of Femoral Artery. E. S. Allen, Louisville.—p. 93.
Health, Its Value to You as an Investment. J. G. Sherrill, Louisville. —p. 95.
Interstitial Nephritis. P. F. Barbour, Louisville.—p. 96.

Laryngoscope, St. Louis

42: 81-162 (Feb.) 1932

Some Observations on Occurrence of and Modifications in Type of Vestibular Nystagmus After Experimental Lesion of Central Nervous System. P. Northington and F. H. Pike, New York.—p. 81.
Otolaryngologic Examination of Nine Hundred and Thirty-Five "Normal" Individuals. W. M. Gafafer, Baltimore.—p. 96.
Unrecognized and Latent Mastoiditis with Lateral Sinus Thrombosis. J. I. Kemler, Baltimore.—p. 101.
*Acute Surgical Mastoiditis Following Fracture. E. C. Smith, La Crosse, Wis.—p. 108.
Agranulocytic Angina: Report of Four Cases. E. Reeves and J. Ryan, Passaic, N. J.—p. 119.
Cellulitis of Pharyngeal Tissues: Mediastinitis: Death. H. M. Hays, New York.—p. 128.
Dilators for Pharyngeal Orifice of Eustachian Tube. S. Yankauer, New York.—p. 130.
*Frontal Lobe Abscess Secondary to Frontal Sinus Infection. B. H. Britton, El Paso, Texas.—p. 133.
Zinc Ionization in Treatment of Chronic Suppurative Otitis Media. N. Asherson, London, England.—p. 141.

Acute Surgical Mastoiditis Following Fracture.—Smith reports three cases of acute mastoiditis developing after basal skull fracture. All terminated fatally. Complications were found in all three cases. In one case there was an extradural abscess and two brain abscesses. In the second case there was a subperiosteal abscess, perisinuous abscess, and sinus thrombosis. The third patient had erysipelas, subperiosteal abscess, and perisinuous and extradural abscesses. The cause of death was meningitis in two of the cases and septicemia in the other one. The author calls attention to the fact that in mastoiditis following fracture the mortality is high and complications are common, principally because of the presence of infection with an open pathway to the meninges. The best chance for success would seem to be in early diagnosis and early surgical intervention. Acute mastoiditis is a delayed complication of basal fractures, and the signs and symptoms are similar to those of acute mastoiditis from other causes. Patients with head injuries should have an ear examination as soon after the time of the injury as possible, and the ears should be closely watched thereafter.

Frontal Lobe Abscess Secondary to Frontal Sinus Infection.—Britton presents a case of frontal lobe abscess secondary to frontal sinus involvement. The invading organism was Streptococcus mucosus-capsulatus. Prior to operation the symptoms were vomiting, headache and a slight rigidity of the neck. There were no localizing symptoms. The frontal sinus was opened and a necrotic dehiscence of the posterior wall was found communicating with an abscess cavity in the left frontal lobe of the brain, measuring approximately 3 by 4 by 6 cm. This abscess was drained. The brow incision under local anesthesia was a satisfactory method of approach. The case is unusual, in that the patient recovered in the presence of repeated positive spinal fluid culture, showing Streptococcus mucosus-capsulatus.

Medical Annals of District of Columbia, Washington

1: 23-48 (Feb.) 1932

Detection of Tubercle Bacilli in Circulating Blood. L. Detre, Budapest, Hungary.—p. 23.
Clinicopathologic Types of Hemochromatosis. P. E. McNabb and E. Horgan, Washington.—p. 28.
*Present Status of Rheumatic Fever and Rheumatic Heart Disease. J. W. Esler, Washington.—p. 35.
Functions of Spleen. L. H. French, Washington.—p. 39.

Status of Rheumatic Fever and Rheumatic Heart Disease.—Esler calls attention to the fact that the question of prognosis in cases of rheumatic heart disease is often difficult. The reason for this is the pernicious tendency to recurrences which is one of the basic characteristics of the disease. The prognosis in general may be said to be good for any individual acute attack but more remotely to be poor. The younger the individual is when he first contracts the disease, the more serious the ultimate prognosis usually becomes. In other words, with rheumatic fever a disease of youth and adolescence, the younger the individual is at the time of his initial attack the more the possibility is of his developing subsequent attacks. The majority who contract the disease in childhood and whose first attack or subsequent attacks produce marked cardiac changes die of their cardiac impairment usually before the age of 40. A most important point for consideration at the time any case is seen is whether there are evidences of activity at the moment. If there are, the cardiac impairment may progress to a degree that is not compatible with life. In the opposite sense, if a case is seen in which valvular heart damage is evident but not sufficient to impair function greatly and in which all history of rheumatic activity is several or many years in the background, the prognosis is naturally much better. In such a case it can be seen that there is enough cardiac reserve remaining to maintain the customary activities of life, and there is less danger of renewed rheumatic infection on account of the years' quiescence. In all its complexities, rheumatic fever presents one of the most difficult ailments that a physician is called on to treat. It requires his ever alert attention over a period of years, and trivial symptoms often merit the utmost respect.

Medical Journal and Record, New York

135: 105-156 (Feb. 3) 1932

Requirements for Successful Treatment of Industrial Mishaps. A. W. Hammer, Philadelphia.—p. 105.
Milroy's Disease. G. R. Burke, Alameda, Calif.—p. 107.
Tuberculosis of Diaphysis of Femur. W. L. Corcoran, New York. —p. 109.
Gastric and Abdominal Symptoms of Irritable Colon (Mucous Colitis, Colitis and Spastic Constipation). S. L. Immerman, Philadelphia. —p. 112.
Acute Upper Respiratory Infection in Infants and Children. S. A. Cohen, New York.—p. 117.
Occurrence and Significance of Leukopenia. C. W. Mucklé, Philadelphia.—p. 120.

135: 157-208 (Feb. 17) 1932

Psychoanalytic Interpretation of Mental Arrest. L. P. Clark, New York.—p. 157.
Simple Method for Determining Normal Average Systolic Blood Pressure at Any Age. F. A. Faught, Philadelphia.—p. 160.
Streptothricosis of Lungs: Report of Two Cases. M. Kerlan, Beverly Hills, Calif.—p. 162.
Peridural Anesthesia: Preliminary Report. A. L. Soresi, New York. —p. 165.
Microcephaly. E. A. Whitney, Elwyn, Pa.—p. 166.
Treatment of Infantile Paralysis with Report of Cases. M. Girsdansky, New York.—p. 168.
Significant Finding in Pleural Effusions: Preliminary Report. L. Bernstein, New York.—p. 169.
Newest Treatment for Angina Pectoris. E. C. Klein, Jr., Newark, N. J.—p. 170.

New England Journal of Medicine, Boston

206: 261-314 (Feb. 11) 1932

Introductory Address at Presentation of Bigelow Medal to Dr. John M. T. Finney. F. B. Lund, Boston.—p. 262.
Changing Conditions in Surgery Since Time of Henry Jacob Bigelow. J. M. T. Finney, Boston.—p. 263.
Congenital Obstruction of Duodenum in Children. W. E. Ladd, Boston.—p. 277.
Diverticula of Intestine. J. W. Jameson, Concord, N. H.—p. 284.
*Intravenous Hypertonic Glucose in Treatment of Cardiac Disease: Preliminary Report. H. B. Sprague and P. D. Camp, Boston.—p. 288.
Acute Pneumothorax: Report of Case in an Infant of Seven Months. H. W. Hudson, Jr., Boston.—p. 291.

Hypertonic Solutions of Dextrose in Treatment of Cardiac Disease.—Sprague and Camp present a preliminary report of the intravenous use of hypertonic solutions of dextrose in the treatment of nineteen cases of cardiac disease. Certain theoretical objections to the method are discussed. The authors feel that the therapy is worthy of trial in cases of paroxysmal dyspnea (cardiac asthma) because of some success which they have had in four cases. It should be considered also in cases of coronary thrombosis with shock, congestive failure not responding to other treatment, and diphtheritic myocarditis, although their experience so far has not shown either marked or permanent benefit. Reports in the literature suggest that repeated small injections (from 10 to 20 cc.) of hypertonic solution of dextrose may help patients with increasing angina pectoris.

New York State Journal of Medicine, New York

32: 125-188 (Feb. 1) 1932

Ether and Nitrous Oxide-Oxygen Anesthesia. J. H. Evans, Buffalo.—p. 125.
"Avertin" Anesthesia. E. H. Stumpf, Buffalo.—p. 126.
Spinal Anesthesia. J. B. Mulholland, Buffalo.—p. 128.
Infiltration Anesthesia. M. Clinton, Buffalo.—p. 130.
Carbon Dioxide: Its Aid to Anesthetics. E. H. Stumpf, Buffalo.—p. 131.
Blood Pressure as Safeguard in Anesthesia. C. J. Durshordwe, Buffalo.—p. 132.
"Don'ts" in Anesthesia. T. C. Burns, Buffalo.—p. 133.
Recorded and Resident Death Rates in New York State. J. V. de Porte, Albany.—p. 135.
Epidemic of Vincent's Angina. H. J. Harris, Westport.—p. 136.
Contralateral Cavernous Sinus Thrombosis. A. Weizenhoffer, Schenectady.—p. 139.
What Medical Society of County of Monroe Is Doing in Health Examination, Organization and Progress. S. J. Appelbaum, Rochester.—p. 142.
Endoscopic Aids in Diagnosis. J. W. Miller, New York.—p. 147.

32: 189-250 (Feb. 15) 1932

A Few Problems of the Modern Doctor. E. H. Cary, Dallas, Texas.—p. 189.
Erie County and Public Relations. Louise W. Beamis, Buffalo.—p. 194.
Intra-Abdominal Hemorrhage of Ovarian Origin. P. C. Morton, New York.—p. 196.
*Radium in Treatment of Inoperable Diseased Tonsils with New Method of Radon Implantation. J. C. Scal, New York.—p. 198.
Recorded and Resident Death Rates in New York State: III. Cancer, All Forms, 1927-1930. J. V. de Porte, Albany.—p. 202.

Radium Treatment of Diseased Tonsils.—While Scal recommends tonsillectomy in operable cases of diseased tonsils, over eight years' experience has convinced him that the implantation of radon seeds constitutes a satisfactory substitute for use in inoperable cases. Neither morbidity nor mortality attends the procedure, and the technic has been so developed that by the method he describes one is able to obtain complete atrophy of the tonsils without producing any inflammatory reaction or injury to the structures surrounding the tonsils. There is no postoperative hemorrhage, no danger of lung abscess, no aspiration pneumonia, and no middle ear involvement. The procedure is practically painless, it can be performed in the office, and the patient may be permitted to pursue his normal mode of life without inconvenience of any description. Of the number of patients treated, 20 per cent were affected with joint symptoms, 28 per cent were cardiac patients, 3 per cent were subject to hemophilia, 5 per cent had exophthalmic goiter, 10 per cent were diabetic patients, 8 per cent had arteriosclerosis, and the rest were treated for "fear of operation." There being no traumatism, one does away with the presence of subsequent scarring and adhesions, so frequently seen after tonsillectomy, even when performed by a skilful operator. In persons subject to hemophilia the bleeding following the needle puncture is sometimes annoying but usually ceases after proper local treatment.

Physical Therapeutics, Elmira, N. Y.

49: 445-493 (Dec.) 1931

Physiotherapy in Urology. W. S. Pugh, New York.
New Method of Diathermy Treatment of Gonorrheal Urethritis. J. Shohan, Greensboro, N. C.—p. 451.

Public Health Reports, Washington, D. C.

47: 241-301 (Jan. 29) 1932

Action of Arsenic on Fixed Sulphydryl Groups of Proteins. S. M. Rosenthal.—p. 241.
Chlorination of Ballast Water on Great Lakes Vessels. G. H. Ferguson.—p. 256.

47: 303-375 (Feb. 5) 1932

Incidence of Epidemic Influenza, 1918-1919: Further Analysis According to Age, Sex and Color of Records of Morbidity and Mortality Obtained in Surveys of Twelve Localities. R. H. Britten.—p. 303.

47: 377-425 (Feb. 12) 1932

Effect of Lithium Chloride on Morphology of Streptococcus Scarlatinae. R. R. Spencer and W. G. Workman.—p. 377.
Calcium, Phosphorus, and Protein Metabolism in Leprosy. J. G. Wooley and H. Ross.—p. 380.

Radiology, St. Paul

18: 221-470 (Feb.) 1932

Roentgenologic Exploration of Mucosa of Gastro-Intestinal Tract. Cole Collaborators, New York.—p. 221.
Gamma Radiation of Radioactive Substances. J. Thibaud, Paris, France; Translated by H. Bayon, New Orleans.—p. 265.
*Application of Roentgen Radiation to Barium Filled Stomach. T. Scholz, New York.—p. 269.
*Intrathoracic Localizations by Stereoroentgenography, with Consideration of Sources of Error. H. C. Sweany, R. Kegerreis and C. E. Cook, Chicago.—p. 277.
*Roentgen Diagnosis and Treatment of Persistent Thymus. M. J. Hubeny, Chicago.—p. 285.
Roentgen-Ray Treatment in Gynecomastia. J. G. Menville, Baltimore.—p. 295.
Direct Computation of Depth Intensity. K. S. Cole, New York.—p. 302.
Systemic Blastomycosis, with Report of Fatal Case. I. Gaspar, W. A. Fenstermacher and L. R. Lingeman, Rochester, N. Y.—p. 305.
Further Observations on High Milliamperage Technic. J. D. Lawson and E. H. Gray, Woodland, Calif.—p. 316.
Adaptation of Technics to Individual Cases: Some Special Views that Have Proved Valuable. H. S. Hunsberger, San Francisco.—p. 320.
Clinical and Therapeutic Consideration of Osteitis Deformans. W. W. Belden and Alice R. Bernheim, New York.—p. 324.
Radiation Treatment of Uterine Hemorrhage of Benign Origin. J. H. Bridenbaugh, Billings, Mont.—p. 349.
Radiotherapy with Small Quantities of Radium. P. O. Snoke, Lancaster, Pa.—p. 353.
Two Unusual Cases Revealed in Routine Roentgenography. C. C. Owen, San Bernardino, Calif.—p. 361.
Hepatosplenography: Roentgenologic Demonstration of Parenchyma of Spleen and Liver by Means of New Intravenous Contrast Medium (Thorotrast). S. Kadrnka, Geneva, Switzerland; Translated by H. C. Ochsner, Indianapolis.—p. 371.

Roentgen Irradiation of Barium-Filled Stomach.—Scholz has noted that roentgen radiation applied to the barium-filled stomach in inoperable gastric tumors seems to aid in the bringing on of the regression of the tumor mass. Avoidance of the suprarenals in the application of radiation to the stomach is of great importance. The best way to avoid the suprarenals is by definitely determining in each individual case their exact position and the position of the stomach. This can be readily accomplished by projecting the outline of these organs on the surface of the body.

Intrathoracic Localizations by Stereoroentgenography.—Sweany and his associates present evidence revealing various types of distortion of stereoscopic roentgen images in roentgenograms of the chest. If one assumes that the exposures are taken in a correct manner with optimal tube shift and distance, and that the viewing apparatus is properly adjusted and correctly used, there are still possibilities of error due to movement between exposures if certain precautions are not closely adhered to. These errors are due to three types of movement: respiratory, cardiac, and that of the trunk as a whole. Cardiac movements are quite variable, but many times, if adhesions are present, they interfere with any localization around the heart. The type of distortion depends on the direction of the motion, which, in turn, depends on the relative phase of the cardiac cycle at the instant of exposure.

Roentgen Diagnosis and Treatment of Persistent Thymus.—Hubeny calls attention to the fact that in the roentgen treatment of persistent thymus there is no need to apply larger doses than necessary, and a certain amount of judgment

in deciding the factors is desirable. In practically no instance is it necessary to give more than one-fourth erythema dose at one time; usually one-sixth or occasionally one-eighth erythema dose may be indicated at one time. In the average case, three treatments are given, about two or three weeks apart. In this way involution is gradual and increased symptoms due to engorgement and toxemia are avoided. In rare instances, eight treatments are necessary. The author had two instances in which an early roentgen examination, made as a precautionary measure, was negative, but several months later symptoms and reexamination revealed the presence of a large thymus. In both cases, roentgen therapy abated the symptoms. These cases indicated that a latent or delayed pathologic thymus may exist. The larger the thymus, usually the smaller the dose; also, the greater the evidences of inanition, the smaller the dose. While it is desirable to make repeated roentgenograms at monthly intervals, the sole criterion is the evidence of improvement, which is remarkably obvious within from a few days to a few weeks.

South Carolina Medical Assn. Journal, Greenville

28: 25-45 (Feb.) 1932

Results of Phrenic Exeresis in Series of Cases at Pinehaven Sanatorium. Anna H. Maxwell, North Wilmington, Mass.—p. 28.
Measles Immunization with Parents' Serum in Private Practice. W. W. Anderson, Atlanta, Ga.—p. 31.
Ewing's Sarcoma. C. Brown, Walterboro.—p. 33.
Increase in Mortality Rate in Acute Appendicitis. S. C. Dean, Anderson.—p. 36.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

16: 65-128 (Feb.) 1932

Contribution to Study of Exfoliation of Lens Capsule or Glaucoma Capsulocuticulare with Anatomic Preparations. M. S. Bey.—p. 65.
*Effect of Adrenalin on Intra-Ocular Pressure and Its Clinical Significance. W. S. Duke-Elder, P. M. Duke-Elder and J. C. Colle.—p. 87.
Primary Melanocarcinoma of Ciliary Body: Case. R. H. B. Barrow and H. B. Stallard.—p. 98.
New Device for Training and Testing Binocular Vision. T. H. Whittington.—p. 105.

Effect of Epinephrine on Intra-Ocular Pressure.—The Duke-Elders and Colle describe experiments on dogs in which they found that as judged from pressure records in the intact animal and the artificially perfused eye, from the change of blood flow as recorded by temperature changes, and from the direct observation of the intra-ocular vessels, it appears that the action of epinephrine on the eye itself uncomplicated by the effects of the general circulation is fourfold: (1) In small doses it dilates the capillaries and raises the intra-ocular pressure; (2) in large doses it constricts the arterioles and capillaries and lowers the pressure; (3) in any dose it constricts the plain muscle of the orbit and raises the pressure, and (4) it dilates the pupil, an action which appears to be without any significant influence on the intra-ocular pressure, since it may be associated with either a rise or a fall. In the intact animal, when the situation is complicated by general vascular changes, the raised blood pressure tends to break through any arteriolar resistance which may be present and causes a rise in the intra-ocular pressure unless (with individual variations) the dosage is very high, when local constriction of the arterioles may be sufficient to counterbalance this. In man the action of Müller's muscle in raising the intra-ocular pressure is much less than in the dog, owing to its small development in the former; it is probable indeed that it may be neglected altogether. Apart from this, the authors' investigation accounts for the variability of the action of epinephrine on the pressure of the eye. Depending on the dose in which it becomes effective in the eye it will either dilate the minute vessels, raising the pressure, or constrict them, tending to lower the pressure, and the possibility of the constriction becoming effective will depend on the extent to which the drug is absorbed into the general circulation. The fact that the vessels of the eye react less markedly than those of large areas elsewhere in the body (particularly in the skin and on the heart itself) makes ocular changes subservient to general changes.

British Medical Journal, London

1: 177-222 (Jan. 30) 1932

*Significance of Hematuria. H. Wade.—p. 177.
*Stroke in High Arterial Pressure: Study of One Hundred and Fifty Cases. H. O. Gunewardene.—p. 180.
Convalescent Serum in Prophylaxis of Measles, Chickenpox and Mumps. W. Gunn.—p. 183.
Lead Poisoning as Cause of Peptic Ulcer. D. R. Lewis.—p. 185.
Gangrene Due to Embolus of Inferior Mesenteric Artery. P. Brown and M. M. Dey.—p. 186.
*Immediate Pneumococcal Typing. R. R. Armstrong.—p. 187.
*Direct Method of Typing Pneumococci. W. R. Logan and J. T. Smeall.—p. 188.

Significance of Hematuria.—Wade emphasizes the fact that when a case of hematuria comes under observation it is the physician's duty to demand that the cause of the bleeding be forthwith determined. This may necessitate a somewhat tedious examination, but the ultimate result is certain. Fortunately, in most cases, when the cause of the bleeding has been determined, a speedy and certain cure can be obtained. In others, especially when malignant disease is present, the outlook is graver. In all of them, however, the earlier the diagnosis is arrived at the better will be the result of treatment, and in all of them, whether they are benign or malignant, the progress of the case afterward should be followed up by reexamination at regular intervals of three months, six months and a year. It is difficult to persuade patients who have been pronounced cured after operative treatment of the necessity of this, and the temptation sometimes is to dismiss them with a reassurance that all is well for all time. Fortunately, in many this will prove to be correct, but slight recurrence may take place in others and, if so, by an accurate follow-up system such recurrence can be observed at its earliest stage and dealt with simply and promptly.

Stroke in High Arterial Pressure.—On the basis of his observations in 150 cases of stroke in high arterial pressure, Gunewardene draws the following conclusions: 1. Transient or permanent paralyses of varied distribution occur fairly frequently. 2. The hitherto neglected sensory phenomena have a distribution similar to the motor phenomena; they also occur frequently and are probably caused through an involvement of the sensory areas, the pathogenesis being similar to that in the motor cases. 3. Strokes often attributed to other factors, such as shock, exertion and emotion, are the result of an already existing pressure exacerbated by the influence of these factors. 4. Cerebral hemorrhage does not seem to occur with diastolic blood pressures under 115 (whatever may be the systolic), and that prognosis may be based on this observation. 5. Cerebral hemorrhage occurs most commonly in people working in defiance of an already existing pressure, and without taking any account of this abnormality. 6. Any kind of paresis or paralysis is very rare in cases in which the diastolic blood pressure is under 115. If it does occur, the minimum diastolic pressure is over 115 at the time of the stroke. Strokes at this pressure are rarely fatal or permanent. The former occurs in patients with thickened vessels or other disease; the latter in an unfortunate few, or in those in whom the causative factor is other than hypertension. 7. Cerebral hemorrhage seems to occur more frequently in those cases of hypertension which show neither marked cardiac enlargement nor symptoms, and rarely in those cases in which there are signs both of considerable cardiac enlargement and symptoms of heart failure.

Immediate Pneumococcal Typing.—The procedure used by Armstrong for the immediate typing of pneumococci is as follows: A suitable fleck of sputum is selected. Three small samples of this are placed, equidistant, on a microscope slide, and numbered 1, 2 and 3. Each sample is emulsified with four times its volume of the corresponding diagnostic serum, the addition of serum and emulsification being conveniently performed with a platinum loop. Cover-glasses are applied, and the slide is set aside for a few minutes while a further sample from the selected fleck of sputum is smeared on a slide, fixed by heat, and stained by Gram's method. The general bacterial flora of the sputum and the number of pneumococci present are apparent at a glance in the stained film, which exactly represents the characters of the sputum samples selected for the diagnostic test. It is of special value to be informed in advance of these characters, for if the pneumococci are plentiful a positive result in the typing will be apparent

at once; no time need be wasted in useless search, therefore, when, as in the case of a group IV infection, there is no reaction. The slide carrying the fresh emulsions of sputum and specific serums is now examined by means of a 4 ocular, one-sixth objective, and plane mirror, the condenser being removed. Whereas the unstained pneumococci, when present in small numbers, are but just visible in the case of a negative test, the result in the case of a positive reaction is a conspicuous increase in the size of the individual pneumococcus, due to conjugation of coccus and homologous antibody. The enlarged cocci have a characteristic ground-glass appearance, with a highly refractive peripheral zone. A positive reaction is at times appreciable to the naked eye on holding the preparation to the light. The positive, as compared with its companions on the same slide (which serve as controls), is seen to be opalescent, owing to the great increase in size of the "sensitized" cocci. When the pneumococci are thickly coated with seromucinous pneumonic secretion, the characteristic appearances develop more slowly as the specific serum soaks its way through. In such cases twenty minutes may elapse before full completion, although type may be distinguished much sooner by the change in those pairs which are floating free.

Direct Method of Typing Pneumococci.—The technic used by Logan and Smeall for the direct typing of pneumococci is practically that described by Armstrong, the sputum emulsion being substituted for the mouse peritoneal exudate. An emulsion of the sputum is made with physiologic solution of sodium chloride. Four thin glass slides are marked I, II, III and control, and a large loopful of the undiluted type serum is placed on the appropriate slide, a drop of physiologic solution of sodium chloride being put on the control slide. The sputum emulsion is then taken up in a capillary pipet with a teat. A drop of the required size is placed beside each drop of serum and then mixed by tilting the slide backward and forward. Sometimes it is better to drop the emulsion on to the serum; in other cases, in which the consistency is more gelatinous, it is necessary to mix with a loop. A thin cover-glass is placed on the mixture, which is then examined under the microscope. The authors use a one-twelfth oil-immersion lens, with the substage condenser racked down a little and the diaphragm closed to an extent which has to be constantly varied to get the best results. The plane mirror and a bright artificial light are employed. In cases in which pneumococci are present in large numbers, the swelling of the pneumococci and the appearance of the dark line sharply outlining the capsule, along with a darkening of the body of the pneumococcus itself—distinct from the whitish, sometimes almost greenish-white, capsular substance—are strikingly seen when the homologous serum has been used. In the other slides the pneumococci are seen to be much smaller, with a small halo which is a little lighter in color than the surrounding sputum substance, but there is no dark line sharply defining the outline of the capsule. In specimens in which pneumococci are scanty it is sometimes only in the slide with the specific type-serum that they stand out and become recognizable, while, in specimens containing many streptococci in diplococcal form, again it is only the reaction to the specific serum that indicates which are pneumococci. With some specimens the test has to be performed several times before a successful result is obtained.

Edinburgh Medical Journal

39: 69-120 (Feb.) 1932

*Myositis Ossificans Progressiva. W. F. Mair.—p. 69.
Osteoma of Tongue. D. M. Greig.—p. 93.

Myositis Ossificans Progressiva.—Mair calls attention to the fact that myositis ossificans progressiva is in a sense misnamed, as the whole of the pathologic process is enacted in and around the interstitial connective tissue, the changes in the muscle occurring secondarily to this. In essentials the disease consists of a gradually progressing ossification, which takes place by a hyperplasia of and replacement of the interstitial connective tissue by a loose embryonic structure which organizes to form a cartilaginous ground-substance. In this process the muscle fibers become atrophied and compressed, and disappear. This cartilaginous ground-substance becomes in its turn the seat of true bone-formation. The derivation of the osteoblasts which take part in this process is still uncertain: there is much to suggest that they are probably some of the connective tissue cells which can assume this special function. The process may not proceed so far—instead of the formation of cartilage and subsequently of bone, the new loose connective tissue may be the seat of deposits of calcium salts, lacking the more orderly arrangement found in bone formation; this appears to be the case in calcinosis interstitialis progressiva. These calcium salts, plus the atrophied and, it may be, disintegrated elements of the original tissues of the part, provide the detritus found in the lesions of these cases. Both of these closely allied conditions are due to a primary disturbance of development—in which in the mesenchyme the potential function of osteogenesis has been impressed on all the connective tissue structures—plus a disorder, the nature of which is quite unknown, of calcium metabolism, "some inborn error of metabolism" (Garrod), permitting, in the one case, the development of hard bony masses and, in the other, calcium deposits in similar situations. Treatment so far seems unavailing.

Quarterly Journal of Medicine, London

1: 1-211 (Jan.) 1932

*Quantitative Observations on Proteinuria in Nephritis. Phyllis M. Tookey Kerridge.—p. 1.
*Some Aspects of Electrocardiogram in Toxic Goiter. C. S. D. Don and G. J. Langley.—p. 9.
*Ventilation Equivalent for Oxygen. H. W. Knipping and A. Moncrieff.—p. 17.
*Occupational Incidence of Primary Lung Cancer. W. Brockbank.—p. 31.
*Anemia with Dysphagia. G. Graham and R. S. Johnson.—p. 41.
Specificity of Skin Reactions in Man in Relation to Tuberculous Infection. P. D. Hart.—p. 49.
*Study of Sleeping Pulse Rate in Rheumatic Children. B. Schlesinger.—p. 67.
*Epidemic Acute Rheumatism in Public School. W. H. Bradley.—p. 79.
*Addison's Disease and Its Treatment by Cortical Extract. S. L. Simpson.—p. 99.
Occurrence of Copper and Manganese in Preparations of Iron. J. H. Sheldon and H. Ramage.—p. 135.
*New Conception of Etiology of Erythema Nodosum. W. R. F. Collis.—p. 141.
Achlorhydria and Achylia Gastrica, and Their Connection with Addison's Anemia-Subacute Combined Degeneration Syndrome and Simple (Non-addisonian) Achlorhydric Anemia. A. F. Hurst.—p. 157.
*Diagnosis and Treatment of Syphilis of Aorta and Heart. C. F. Coombs.—p. 179.

Observations on Proteinuria in Nephritis.—Kerridge presents a series of charts which show that the concentration of protein in the urine of patients with nephritis varies during the day. It is highest in the evening and early morning specimens. A moderate rise in concentration occurs in the middle of the day. The total amount of protein lost is greater by day than by night, owing to the greater relative increase in the volume of urine passed during the day. The effects of getting up from bed, of diuretics and of infections may cause large increases in protein concentration without change in the total amount of protein lost, on account of the simultaneous decrease in urine volume in inverse proportion. The author suggests that the total protein loss per twenty-four hours is a more valuable clinical guide than the protein concentration in a single specimen of urine. When a twenty-four hour specimen is not available, the concentration of protein in an early morning specimen will give more useful information than that in a specimen passed during the day.

Aspects of Electrocardiogram in Toxic Goiter.—Don and Langley produce evidence to show that electrocardiographic changes in toxic goiter may belong to any of three classes: (1) toxic, transient and recoverable, in which cases tracings before operation have shown undoubted signs of muscle change but, when repeated three or four years later, presented a total absence of such abnormalities; (2) toxic changes which are found to persist three or four years later, unchanged in degree, in spite of manifest benefit from the surgical treatment adopted, and (3) changes which must be regarded as not only organic and permanent but actually progressive in character, in spite of the apparent success resulting from treatment when judged from the purely clinical aspect. The authors have failed to find any data on which an opinion could be based, as to the class to which any individual patient would ultimately belong, and such criteria as have been suggested by other workers found no constant counterpart in the series of cases which they have studied.

Ventilation Equivalent for Oxygen.—According to Knipping and Moncrieff, the ventilation equivalent for oxygen is defined as the volume of air which has to be inspired in order that 100 cc. of oxygen shall be obtained by the body (Anthony). In normal subjects its value is approximately 2.4 liters and under experimental conditions remains unaltered after food or on moderate exercise. It is raised by emotional influences, lowered in sleep, and considerably increased if the carbon dioxide or oxygen content of the inspired air is varied outside physiologic limits. In pathologic conditions the ventilation equivalent for oxygen is altered according to various factors. Thus depression of the respiratory center (e. g., morphine poisoning) causes a decrease, and stimulation of the center (e. g., diabetic coma) causes an increase in its value. In disease of the circulatory and respiratory systems the equivalent is raised roughly in proportion to the degree of failure in the normal function of these systems. The equivalent appears to give a good indication of the state of pulmonary efficiency, and its determination may prove of value in connection with the development of thoracic surgery. The type of dyspnea present in disease conditions may be elucidated to a certain extent by a determination of the ventilation equivalent for oxygen, which appears to give a rapid method of distinguishing between diabetic coma and morphine poisoning, for example, and in diabetic coma serves the further purpose of giving a delicate indication of the degree of ketosis present.

Occupational Incidence of Primary Lung Cancer.—Brockbank reports that an investigation of the occupations in 898 cases of primary lung cancer collected from the literature suggests that the laboring classes predominate, although no one occupation stands out. Poison war gas, tobacco smoking, road dust and motor car fumes are all possible etiologic factors. The occupations of sixty-two patients were investigated in some detail. Nine (14.5 per cent) seemed to have definitely dusty jobs, and eighteen (29 per cent) worked among gases and fumes. Four were badly gassed in the war, and nine smoked excessively. A plea is made for more detailed investigation of the occupations of patients suffering from this disease.

Anemia with Dysphagia.—Graham and Johnson have studied five patients in whom the syndrome of dysphagia and anemia was fully developed and one in whom all the signs were present with the exception of the dysphagia. They believe that the presence of increased fragility of the red cells in patients with well marked secondary anemia and dysphagia suggests that the anemia is not due to the ordinary causes of secondary anemia and is not identical with the "chronic microcytic anemia" described by Witts. The only other condition in which increased fragility of the red cells is known is acholuric jaundice. The symptom of dysphagia has not been present in any of the authors' cases of acholuric jaundice and is not reported or recorded in any of the published cases. It therefore seems probable that the type of anemia in these cases is a new and peculiar one of specific type, associated with a slight increase in the fragility of the red cells, and with achlorhydria and secondary changes in the mucous membrane of the tongue, mouth and esophagus, and subsequently with dysphagia.

Sleeping Pulse Rate in Rheumatic Children.—Schlesinger calls attention to the fact that study of the pulse rate, awake (the alert pulse), is not sufficient to establish the presence of active carditis in afebrile children with rheumatic heart disease. Normally the sleeping pulse rate is on an average 10 beats a minute slower than the alert pulse. A rapid alert pulse rate unaccompanied by a similar increase in the rate during sleep points to a nervous tachycardia. Active carditis can be presumed if, in the absence of fever, the sleeping pulse rate approximates the alert rate so as to diminish or abolish the normal variation between the two. A sleeping pulse rate continuously and decisively above the normal is also strong evidence of active heart disease, even though the variation between the rates awake and during sleep persists.

Epidemic of Acute Rheumatism in Public School.—Bradley records two epidemics of rheumatism and demonstrates their relation to parallel waves of hemolytic streptococcal sore throat, the causal streptococci being of two distinct strains. Survey of the epidemiologic factors concerned leads to the conclusion that droplet infection was responsible for the spread of sore throat and consequently of rheumatism. The author tentatively suggests that rheumatism occurred in those who, being incompletely immunized by a first contact with a rheumatism-producing streptococcus, developed hypersensitiveness (allergy) to that organism.

Addison's Disease and Its Treatment by Cortical Extract.—Simpson describes six cases of Addison's disease, and their treatment with cortical extract. All the patients benefited from cortical extract therapy, but three subsequently died. Complications were present in these cases; namely, influenza, diabetes mellitus and severe anemia. The three surviving patients are in relatively good health, although two of these were almost moribund at the time treatment was initiated. A fairly persistent low blood sugar is noted to occur in Addison's disease, and the effect of epinephrine in raising it is recorded. The possibility of epinephrine being a factor in regulating blood sugar is discussed. Carbohydrate tolerance tests give some indication of increased tolerance in Addison's disease, but the probability of delayed absorption is a complicating factor. A case of diabetes mellitus coexisting with Addison's disease is described. High blood urea occurs in severe phases of Addison's disease, together with urea retention and impaired renal function. Renal damage and dehydration are considered to be important factors. The significance of creatine and creatinine variations is discussed. A low gastric acidity or complete achlorhydria is frequently encountered in Addison's disease. Blood counts show a moderate eosinophilia and a relative lymphocytosis. Marked anemia is not usually a feature of Addison's disease but may occur. The value of roentgen examination in confirming the diagnosis of Addison's disease is illustrated. Details of treatment with, and dosage of, cortical extract are discussed; also the subsidiary rôle of intravenous fluids and epinephrine.

Etiology of Erythema Nodosum.—Collis reports five cases of erythema nodosum intimately associated with tuberculosis, in three of which tubercle bacilli were found in the stomach wash-out. Three cases following streptococcal sore throats are given in detail. These patients gave strongly positive skin reactions to hemolytic streptococcal endotoxin, while all three were negative to tuberculin. Six cases not seen during the attack are reported. Four of these fit into the tuberculous and two into the streptococcal type. A case of suspected tuberculosis is described in which the injection subcutaneously of 0.005 cc. of old tuberculin caused an eruption, indistinguishable from erythema nodosum, to appear on the legs, and was associated with a thirteen-day febrile reaction. A second similar injection a month later again produced a similar eruption, but this time without a general febrile reaction. These facts suggest that erythema nodosum is a type of hyperreactive tissue response to different bacterial allergens and that the allergens responsible for erythema nodosum in London are commonly tuberculin and hemolytic streptococcal endotoxin.

Syphilis of Aorta and Heart.—Coombs states that the heart and great vessels show evidences of attack by syphilis (1) during or soon after its earlier blood-borne phase, and (2) at an interval of one, two or more decades after the primary infections. The second group is many times larger than the first and is much less amenable to treatment. In the latter fact, as well as in the delayed and insidious manner of its origin, these later lesions resemble those of the tabetic form of dementia paralytica. The aortic inflammation which is the chief feature of this group is apparently provoked by irritation reaching the aortic wall through lymphatic channels. There are reasons for thinking that the source of this trouble lies in the mediastinal lymph nodes and that these act as reservoirs of infective material. By the time this material has spread from the lymph nodes to the aorta in quantity sufficient to cause changes appreciable to the clinical observer, the damage done is already considerable and largely irreparable. The treatment of cardiovascular syphilis is that of syphilis itself. From the moment of diagnosis of the initial lesion the duty of the medical man in charge is to maintain an attack on spirochetes; and it is probable that the best results will be achieved if this attack is renewed from time to time throughout the patient's life, even in the absence of symptoms, signs or serum reactions indicative of any active infection. And if, unhappily, evidence of cardio-

vascular disease should develop notwithstanding, this should be attacked by potassium iodide and by arsenic, mercury or bismuth compounds. Arsenic should not be given if there is evidence of an advanced aortitis; if the aortic valves are already leaking, arsenic should be given in small doses, and, if there are signs of coronary stenosis, it should not be given at all. In its place mercury may be given, or bismuth if the judgment of the medical man leads him to prefer it. From that time onward, treatment by potassium iodide, together with one or other of the spirillicides, must be maintained, except for the intervals that are needed to detoxicate the patient and to give him a rest from time to time.

Journal of Oriental Medicine, South Manchuria

16: 1-10 (Jan.) 1932

Flagellates in Mukden. W. Skvortzow.—p. 1.
Acute Leukemia. K. Kashiwabara.—p. 5.
Studies on Character of Variola Inoculated into Anterior Chamber of Eye. T. Komiyama.—p. 6.
Influence of Extract of Placenta and Urine of Pregnant Women on Development of Genital Organs of Infantile Male Mice. S. Kuga. —p. 7.
Larynx of Chinese: Musculature. M. Sayama.—p. 8.
Fluctuation of Amount of Blood Sugar in Rabbits Due to Repeated Morphine Injections. Y. Tachikawa.—p. 10.

Clinique, Paris

27: 21-40 (Jan.) 1932 (B)

Marriage of Syphilitic Persons. M. A. Galliot.—p. 25.
Venous Stasis Occurring in Cardiac Asthma and Various Other Diseases. C. S. Danzer.—p. 27.
*New Treatment of Lambliasis. Chantriot.—p. 29.
Intratracheal Injection of Iodized Oil in Individuals Who Have Been Gassed: Anteroposterior and Profile Roentgenograms. G. Rosenthal. —p. 34.

New Treatment of Lambliasis.—Chantriot introduces his study of the treatment of lambliasis with a discussion of the diagnostic difficulties. The presence of the flagellates or their cysts in feces is insufficient for a diagnosis of lambliasis since carriers may suffer numerous forms of dyspepsia or enteritis and their symptoms may be due to pathogenic intestinal bacilli, Endamoeba histolytica or Trichocephalus. On the other hand, negative phases have often been found in demonstrated cases of lambliasis. If fecal examination is negative for Endamoeba histolytica or abundant polymorphonuclear cells and the patient exhibits a persistent dysenteriform syndrome, together with a strong alkalinity of the feces and a marked urobilinuria, the author makes a diagnosis of lambliasis. In half the cases so diagnosed, subsequent fecal examination confirmed the diagnosis. The author believes that the incidence of lambliasis is much higher than statistics show. He attributes this to a tendency of clinicians to diagnose this ailment as amebiasis and to the frequent negative coprologic observations. He offers an explanation for the negative fecal examinations in a study of the habitat and biology of the parasite. He reviews the works of several authors confirming the presence of the parasite in the biliary tract and its ability to vegetate in the intestine, producing an enteritis and then ascending to the biliary tract, where it remains latent. The infected biliary tract is a constant source of renewed intestinal infection. Chantriot's clinical observations substantiate the opinion that the alkalinity of the residual liquids in the duodenal-biliary retreat favor the localization and persistence of the saprophytic forms. The author distinguished four forms of lambliasis in his patients: (1) the hepatic form, (2) the enterocolitic form, (3) the hepatodysenteric form and (4) the form with associated diarrheas. In all cases he found the enterocolitis only a manifestation of an infection of the gallbladder or the excretory ducts, so he concludes that lambliasis is in the majority of cases a cholecystitis or duodenitis secondarily complicated by enterocolitis. The author's treatment, based on this conception, consists of (1) intense and prolonged medical drainage of the bile ducts with the usual cholagogues and antiseptics, (2) simultaneous and prolonged administration of lemonade or diluted hydrochloric acid to neutralize the alkalinity of the duodenal biliary fluid, (3) injection of a proprietary preparation of arsenic and emetine as an antiparasitic agent, and (4) the systematic treatment of the so-called healthy carrier of cysts, consisting of examination of feces, duodenal drainage and supervision of diet.

Écho Médical du Nord, Lille

36: 37-48 (Jan. 23) 1932

Large Pyonephrosis Simulating Ovarian Cyst. E. Delannoy and Driessens.—p. 37.
*Rare Complications of Gangrenous Appendicular Peritonitis. J. Minne. —p. 38.
*Edematous Pancreatitis: Operation and Cure. P. Razemon and M. Lambret.—p. 41.
Chemical War in the Air; Danger from Above; Protection of Civilians. Vendeuvre.—p. 43.

Rare Complications of Gangrenous Appendicular Peritonitis.—Minne reports the case of a boy, aged 10, admitted to the hospital with the diagnosis of appendicular peritonitis. Immediate operation disclosed subperitoneal edema, a large quantity of intraperitoneal, brown, very fetid pus, gangrenous patches on the parietal peritoneum and the cecum, and the appendix adherent to the gallbladder, enormous, black, with perforation of its tip and surrounded by a large focus of gangrene. After resection of the appendix the cavity was filled with a Mikulicz drain soaked with antigangrenous serum and an energetic postoperative treatment instituted, prognosis being very bad. Two days later a gangrenous portion of the omentum was found and resected and the rectovesical space drained. Ten days after operation a fecal fistula appeared at the site of insertion of the appendix; there was a rise in temperature and an inflamed aspect of the left side of the scrotum from which fecaloid pus was drained on incision; the boy had a congenital left inguinal hernia with resulting left vaginal pyocele. Slow recovery followed for one month, leaving only the fecal fistula to be attended to. The first two attempts at extraperitoneal closure of the fistula were unsuccessful, the second one resulting in reinfection of the surrounding abdominal wall. A third attempt made four months after the initial operation succeeded, thanks to a radical intraperitoneal intervention. A large eventration persisting at the site of the original Mikulicz packing was later operated on and the abdominal wall perfectly restored.

Edematous Pancreatitis.—Razemon and Lambret describe their patient's symptoms, which made them believe in the presence of perforation of a duodenal ulcer and the actual observations they made at operation: subperitoneal edema round the second portion of the duodenum increasing toward the jejunal angle, patch of hemorrhagic infiltration of the mesocolon about 10 cm. wide, pancreas enlarged, edematous and presenting small subserous hemorrhages, 2 or 3 cc. of serosanguineous fluid in the pancreatic lodge but no sign of the typical wax candle necrotic spots on the omentum and the parietal peritoneum. Uneventful recovery followed on simple drainage. They state that their patient was suffering from edematous pancreatitis, a rare and imperfectly known disease. They discuss the opinions of several authors on the etiology and the pathology of the disease and conclude against the principle of nonintervention.

Gazette des Hôpitaux, Paris

105: 162-176 (Feb. 3) 1932

*Myoclonic Form of Cerebral Syphilis. R. Poinso, M. Legrand and R. Beaucaire.—p. 165.

Myoclonic Form of Cerebral Syphilis.—Poinso and his co-workers discuss a case of cerebral syphilis which later evolved toward dementia paralytica and which was accompanied by myoclonic attacks, hiccups and fever. These signs are seldom found in syphilis of the brain and often lead to a mistaken diagnosis of a myoclonic form of encephalitis. The sudden attacks of myoclonia were characterized by very rapid contraction and relation of one or several muscles, projection under the skin of these muscles as if they had been stimulated by an electric current, no displacement of the extremity, variable frequency (from 10 to 80 a minute) and rhythmic, isochronous spasms. In contrast with myoclonia present in encephalitis, there was no attenuation or exacerbation by movement, agitation or sedative therapy. The myoclonia persisted for five or six days at a time and only a soporific caused it to disappear. It was not accompanied by pains; the involved muscles were not painful on pressure. Two days after the disappearance of the myoclonia there appeared an attack of hiccuping that lasted two hours (diaphragmatic myoclonia). The authors compare their personal observation with two others reported in the literature. They believe that motor disturbances, particularly

myoclonia, are of cortical and meningo-encephalitic origin—the cerebral cortex is irritated by a considerable thickening of the meninges.

Gazette Médicale de France, Paris

Jan. 15, 1932 (number 2) pp. 45-76

History of Hyperparathyroidism. M.-P. Weil.—p. 45.
Hypertrophying Osteopathies. C. Lasserre.—p. 48.
*Rheostosis (Melorheostosis of Léri and Joanny): Case. M-P. Weil and R. Weismann-Netter.—p. 50.
Two Great Syndromes of Chronic Rheumatism. R. Ardillier.—p. 53.
Treatment of Hemoptysic Tuberculosis. R. Pigeon and E. Maison.—p. 58.

Rheostosis.—Weil and Weismann-Netter report a case in which there was a history of a long series of diseases (repeated polyarthritis, pulmonary tuberculosis, malaria, various traumatisms), all of which, they believe, were independent of the disturbances which develop in "streak" hyperostosis characteristic of the disease first reported by Léri and Joanny (*Société médicale des hôpitaux*, July 7, 1922) and designated as melorheostosis. These infections (eleven others have been reported in the literature) are characterized by a hyperostosis with continuous streaks in the bones of the upper and lower limbs. In their single observation, the hyperostosis was limited to the right side: the second and third fingers of the right hand, the whole length of the humerus, the level of the glenoid cavity, the coracoid process, the adjacent part of the external margin of the scapula, the fourth right rib and a distinctly dense opacity in the right clavicle. The articular spaces, the two bones of the forearm and the acromion were intact. There were several characteristics peculiar to their observation: 1. The streaking was discontinuous (the two bones of the forearm were intact). 2. The morbid condition was present in the entire fourth rib of the right side, including the vertebral insertion (in Léri's case an osseous nodule developed at the level of the rib on the side opposite the diseased limb). The authors believe that the name of the disease should not be limited to the term melorheostosis but that the more general term "rheostosis" should be substituted. They believe that the condition is an hypertrophying and condensing osteitis.

Lyon Médical

148: 629-660 (Nov. 29) 1931

*Tuberculous Meningitis with Puriform Cerebrospinal Fluid. J. Chalier, H. Naussac, C.-E. Boyer and A. Guichard.—p. 629.

Tuberculous Meningitis with Puriform Cerebrospinal Fluid.—Chalier and his co-workers assert that tuberculous meningitis is not always characterized by a clear spinal fluid. The meningeal serosity may become xanthochromic and amber colored, sometimes hemorrhagic, and exceptionally it may become cloudy and puriform. In the latter eventuality there is almost always an association with a pyogenic organism; however, the tubercle bacillus alone may sometimes produce a puriform spinal fluid. Their observations demonstrate some cases of tuberculous meningitis in which a clear spinal fluid became opaque or cloudy, clear white, slightly opalescent, later the color of rice water, or even slightly shading toward an amber yellow; in extreme cases it became puriform if not purulent. The abundant fibrinous flocculation falls to the bottom of the tube or floats freely in the liquid. Centrifugation gives a marked sediment. The cytology is variable, sometimes the polymorphonuclear, sometimes the mononuclear leukocytes predominating. This cloudy state of the spinal fluid is present in tuberculous meningitis when a pyogenic microbe, most often the meningococcus, sometimes the pneumococcus, is associated with the tubercle bacillus. Among a group of 100 cases of tuberculous meningitis (37 verified anatomically and bacteriologically), there were 3 cases of pure tuberculous meningitis and 8 cases of associated bacterial tuberculous meningitis, all presenting a cloudy spinal fluid. The authors discuss seven case histories and conclude that there is a rare and little known form of tuberculous meningitis in which the tubercle bacillus acts as a pyogenic micro-organism and can produce an opacity of the subarachnoid fluid without the association of any other organism. This type of meningitis is of great clinical interest, owing to the fact that it simulates in all respects acute and particularly meningococcic meningitis and therefore may lead to errors in treatment. A point of interest in prognosis is the fact that these cases evolve a little more rapidly than the ordinary forms of tuberculous meningitis.

Paris Médical

1: 45-72 (Jan. 16) 1932

Dermatology in 1932. G. Milian and L. Brodier.—p. 45.
*Ulceronecrotic and Vegetating Form of Buccal Fusospirillosis. J. Gaté and P.-J. Michel.—p. 51.
*Insulin in Treatment of Urticaria. P. Chevallier.—p. 54.
Eczema Due to Woodlands and Sylvan Sensitization. E. Schulmann and P. Détouillon.—p. 55.
Leprous Rhinitis. J. Fouquet.—p. 62.
Impetigenous Crusts in Arsenical Erythrodermia. Milian and Degos.—p. 65.
Professional Ulceration of the Balls of the Fingers and Thenar Eminence of Hand. Milian.—p. 68.

Ulceronecrotic Form of Buccal Fusospirillosis.—Gaté and Michel assert that Vincent's fusospirillary symbiosis may produce isolated ulcers, and necrotic and atypical lesions in different parts of the mouth. Their two personal observations include one patient with a true ulceronecrotic sphacelous glossitis of the tip of the tongue, and a second patient with the fusospirillary infection localized on the internal surface of the cheek. Local treatments (frequent gargling with boiled water to which some hydrogen dioxide was added, painting twice daily and alternately with a 10 per cent solution of silver nitrate and a 1 per cent solution of methylthionine chloride, local dressings with neoarsphenamine, and excision of the pseudomembranous formations) led to recovery. Prophylaxis should include treatment of the primary foci (gingivitis and pyorrhea) as well as repair of the teeth. The anatomopathologic study of their personal observations added to other observations from the literature lead the authors to emphasize the importance of spirillary infections in papillomatous processes.

Insulin in Treatment of Urticaria.—Chevallier believes that one of the greatest obstacles in the prolonged treatment of diabetes with insulin is the appearance of urticaria. In the presence of urticaria, hyperglycemia is exceptional; nevertheless insulin has been found beneficial. The author does not know whether benefit can always be received but asserts that incessant and rebellious urticaria in two of his patients improved when he administered, morning and evening, with the usual precautions, 5 units of insulin. Insulin transformed the severe urticaria to a light form. Although pancreatic extract is not of much value in acute and light forms of urticaria, subcutaneous injections of insulin seem to be the treatment of choice in severe chronic urticaria.

Presse Medicale, Paris

40: 137-160 (Jan. 27) 1932

*Mexican Exanthematic Typhus: Rôle of Rats and Fleas. C. Nicolle and Hélène Sparrow.—p. 137.
Acquired Humoral Immunity and Flocculation. A. Lumière.—p. 139.
*Three Cases of Encephalomyelitis Following Measles. L. van Bogaert, Borremans and Couvreur.—p. 141.

Mexican Exanthematic Typhus.—Nicolle and Sparrow assert that, in general, Mexican typhus is similar to the typhus of the Old World. There are certain differences, however, and these are: more abundant and more extensive eruption in Mexican typhus (the eruption affecting sometimes the palm of the hands and the sole of the feet as in acneform fever); less marked cerebral and cardiac symptoms; less gravity even in the new cases; much shorter convalescence, and more marked tendency to hemorrhage, particularly to epistaxis. There is, then, some difference from a clinical point of view and distinctly from an experimental point of view between the two varieties of the same disease. These differences are rendered minimal, owing to the community of preventive antigens which show cross-immunity and owing to the undeniable rôle of the skin as an agent of transmission in epidemics. The two factors of great importance are the existence of the natural infection in the rat and the rôle of the flea in the transmission of the disease from rat to rat.

Three Cases of Encephalomyelitis Following Measles.—Van Bogaert and his co-workers discuss at length three personal observations and conclude that the presence of encephalitis subsequent to measles can be explained without recourse to the hypothesis of an unknown and reactivated virus. In these hyperacute processes there is a massive toxemia extending beyond all the humoral barriers, and the histopathologic lesions are those of a rapidly fatal intoxication. In its latent form it is only a central hyperallergic reaction in individuals with an inefficient cutaneous defense and an insufficient hemato-

encephalic barrier. In some cases, the patient arrives at immunity only at the price of cerebral lesions so grave that survival is impossible. It is possible that the increase in the number of cases during the last few years is due to a slow but progressive modification in the sensitivity of individuals: these modifications are contributed to by therapeutic methods, since encephalitic incidents have frequently been observed during the last few years, not only in infectious exanthems of infants but also in serum diseases of adults.

Revue Médicale de la Suisse Romande, Lausanne

52: 1-64 (Jan. 25) 1932

Hepatobiliary Disturbances Simulating Lithiasis. P. Savy.—p. 1.
*Chordotomy. Julliard.—p. 20.
Congenital Dextrocardia: Two Cases. I. Manhaim.—p. 43.

Chordotomy.—Julliard states that in the spinal medulla there exists a region where the fasciculi that conduct pain are separated not only from the fasciculi that are concerned in the motor and sympathetic impulses but also from those concerned in tactile and deep sensation. This is the region included in the chordotomy. The author reviews a personal observation and discusses the anatomy, the operative indications, the technic and the immediate complications. He reports that of 144 interventions collected from the literature 108, or 75 per cent, gave favorable and 9 per cent incomplete results; 4 per cent were failures because of errors in technic. In 5 per cent the condition recurred. The mortality was from 5 to 7 per cent. The author concludes that his study proves that chordotomy is not a dangerous operation and is immediately efficacious; it is indicated in intolerably painful cases: those that are impossible to cure by internal medication, roentgen therapy or radicotomy, and in inoperable or recurrent cancer. In these patients the late disturbances consecutive to chordotomy, if they appear, are confused with the progress of the cachexia, but at least the pain is suppressed. Chordotomy is also indicated in noncancerous incurable diseases with extreme pain which lead the patient to suicide or renders his life unbearable. In the latter category the surgeon cannot fix general rules but must let himself be guided by his clinical sense in the cases in which the diagnosis is definite.

Annali Italiani di Chirurgia, Naples

10: 1365-1514 (Dec. 31) 1931

*Ligation of Hepatic Artery and Grafting of Its Terminal Head into Portal Vein. V. Ghiron and A. Brunacci.—p. 1365.
*Diagnosis, Treatment, Anatomopathologic Observations and Final Outcome in Rectal Cancer. M. Novi.—p. 1389.
Postoperative Mesenteric Thrombophlebitis: Case. V. Finucci.—p. 1447.
Teratomas of Mediastinum. L. Sussi.—p. 1471.

Ligation of Hepatic Artery and Grafting of Its Terminal Head into the Portal Vein.—Ghiron and Brunacci report the results of an experimental research consisting in the ligation of the hepatic artery and grafting of its terminal head into the portal vein, an operation successfully performed on dogs. Such an intervention might be advisable in cases of irremediable lesion of the hepatic artery to prevent necrosis of the hepatic tissue. The authors cite also published cases of various lesions of the hepatic artery in man.

Treatment and Final Outcome in Rectal Cancer.—Novi reports fifty-seven cases of rectal cancer observed in the surgical clinic at Bologna from 1920 to 1930. After discussing briefly the general nature of the disease and individual cases from the standpoint of the clinical observations, the operative treatment, the postoperative course, the anatomopathologic observations and the final outcome, he states that he observed, among the malignant tumors diagnosed in the clinic, 5.4 per cent of cancer of the rectum, and among the malignant tumors of the intestine, 43 per cent. He noted a higher percentage in patients over 50 years of age and a higher percentage in men than in women. Seeking the predisposing influences in the disease, he found evidence of direct heredity in 20 per cent. Taking the cases as a whole, he found an operability of 50 per cent and an operative mortality of 14 per cent, caused in most cases by infections. There was a survival of 50 per cent for more than one year, of 20 per cent for about three years, and only two of the twelve patients operated on from 1920 to 1925 survived more than five years. The author is an advocate of an early coccygoperineal intervention, which, with a systematic digital examination of the rectum, may often be carried out. Through examination of the anatomic specimens, the author discovered in almost half of the cases an annular adenocarcinoma, usually rectosigmoidal, formed by cylindric cells.

Archivio Italiano di Urologia, Bologna

8: 351-432 (Dec.) 1931

A Centrifuge for Collection of the Finest Sediment. E. R. W. Frank.—p. 351.
Vesicorenal Reflex. E. Sacco.—p. 357.
*Extensive Stenosis of Neck of Bladder. L. Migliardi.—p. 386.
*Congenital Hydronephrosis. L. Torchiana.—p. 401.
*Leiomyomas of Bladder. F. Garofalo.—p. 416.

Extensive Stenosis of Neck of Bladder.—Migliardi's examinations of his own ten patients, together with the case histories published by various authors, have convinced him that wide stenosis of the neck of the bladder, which is not due to prostatic hypertrophy but gives rise to a similar dysuria, is essentially the result of an anatomic lesion. The dynamic element intervenes here, as in prostatic disease and in urethral contraction, as a secondary factor causing a functional disturbance. In his own cases, as in the greater part of those described by other authors, on exploring the interior of the bladder with the finger, a certain degree of contraction of the neck was discovered. In spite of the stenosis, however, the cystoscope could be passed. Furthermore, on examining the exposed neck microscopically, an anatomic change was always found, consisting in an increase of the normal tissues affecting the glands, the smooth muscle and the connective tissue. The similarity to the wide contraction of the urethra is at once apparent; hence the term "wide stenosis of the neck of the bladder" seems entirely suitable.

Congenital Hydronephrosis.—Torchiana describes a case of congenital voluminous hydronephrosis operated on in a child, aged 14 months, in which the kidney and the renal pelvis were reduced to an enormous sac that measured 25 cm. in length and 50 cm. in circumference. Recovery followed the surgical operation. The case is interesting since, at the intervention, neither anomalous vessels nor complete atresia of the ureter was found, but, instead, a marked degree of stenosis at the level of the orifice from the pelvis into the ureter and a kinking of the ureter. The author takes occasion, on the basis of these observations, to show that in such cases one may suspect a congenital malformation. He assumes, namely, in agreement with Bard, that there must have been a primary dilatation of the pelvis, as the first cause of the hydronephrosis, following which there developed retention of the urine, and kinking and fixation of the ureter.

Leiomyomas of Bladder.—Garofalo brings out that smooth-muscle tumors of the bladder are rare, only about forty cases having been reported in the literature. The author, from a study of a case of cavitary myofibroma in a woman, aged 37, takes occasion to review the literature of the subject and to establish the anatomopathologic and clinical picture of the disorder. He examines the histopathogenic theory, which is based on the embryonal theory of Durante-Cohnheim. He describes the anatomic types and the physical and functional signs pointing to an interpretation of the causes. He applied cystography and furnished thus the first cystogram of tumors of this nature. He discusses briefly the complications and the treatment, which should be surgical, not only in cavitary leiomyomas but also in interstitial and peripheral smooth-muscle tumors. He emphasizes the good immediate postoperative results secured during the past twenty years and calls attention to the excellent outcome in his own patient, a woman, who is in the best of health after the lapse of two years since the intervention.

Il Cervello, Naples

11: 1-88 (Jan. 15) 1932

*Differential Diagnosis Between Serous Meningitis and Cerebral Tumor. E. Medea.—p. 1.
Tonus of Mimetic Muscles in Certain Morbid Conditions. T. Senise.—p. 7.
Hysterical Syndrome and Cerebral Tumor. O. Stiesa.—p. 12.
Cerebral Sarcoma: Case. P. Armenise.—p. 25.
Dermographia in Psychopaths. F. Petroselli.—p. 40.
*Etiopathogenesis of Dementia Praecox. F. M. Chiancone.—p. 47.

Differential Diagnosis Between Serous Meningitis and Cerebral Tumor.—Medea emphasizes that the differential diagnosis between serous meningitis and cerebral tumor is

always difficult. He states, however, that the precedence of trauma or infection, the relative age, the results of the examinations of the spinal fluid (especially in relation to the pressure and the rachidial quotient), the existence of slight fever, pains in the lower limbs and in the spinal column, general weakness and particularly of the lower limbs, intense headache usually associated with vomiting, tremor of the hands, the therapeutic advantage with reference to puncture of the corpus callosum, in addition to other observations (remissions, course, duration), point to serous meningitis instead of cerebral tumor.

Pathogenesis of Dementia Praecox. — Chiancone is inclined to seek the pathogenesis of dementia praecox in a profound change in the cellular biochemistry of the whole organism, which manifests itself by changes in the nervous system, together with disturbances of this or that organ, system and function. Only thus can he explain the multiplicity and the diversity of the observations made by investigators and comprehend in a measure the improvements recently obtained with vitamin treatment and manganese, since both vitamins and colloidal manganese, as all colloidal metal salts, modify more or less profoundly the biochemistry of the cell. And when one recalls that this type of disease presents itself under the most widely different aspects, so that a rigid classification is impossible, that each single case may be regarded as of a slightly lower order than another more grave, so that it is possible to establish a gradual succession of cases from those that are barely diagnosticable to those that are most grave, it will be seen that it is not the anatomic alteration of an organ which lies at the basis of a disease so complex and varied but that, from the beginning, through processes that thus far have eluded research, the cell must undergo changes in a peculiar and individual manner in all the patients with a form of this disease—changes affecting its metabolism and its biochemical activity.

Minerva Medica, Turin

1: 45-80 (Jan. 14) 1932

*Primary Hemolytic Splenomegaly with Perniciosiform Anemia and Symptomatic Hemolytic Splenomegaly. E. Musante.—p. 51.
Blood Changes Following Injections of Insulin and Their Relation to Hypoglycemic Phenomena. E. Filla.—p. 59.
Pulmonary Anthracosis, Cardiac Insufficiency, Incomplete Addison's Disease. P. Sisto.—p. 62.

Primary Hemolytic Splenomegaly with Perniciosiform Anemia.—Musante's case of primary splenomegaly in a shoemaker aged 28 is especially interesting owing to the absence of fragility of the blood, a rare observation showing that diminution of the osmotic resistance of the red corpuscles is not essential for the diagnosis of hemolytic splenomegaly, although it is one of the most important diagnostic signs. Another important fact in this case was the type of anemia that accompanied the hemolytic syndrome (pernicious anemia). This fact justifies Micheli's division of hemolytic anemias into various subgroups, among which is hemolytic splenomegaly with pernicious anemia. This case shows further that the disappearance of the icterus, the splenomegaly and the oligocythemia does not furnish sufficient evidence of recovery from the disease if the marked anisocytosis and the poikilocytosis, which constitute the constitutional stigmas of the disease, persist. A second case, symptomatic hemolytic splenomegaly in a man aged 40, shows that syphilis may be the cause of a syndrome of hemolytic anemia with all the characteristic symptoms of that disease, and that antisyphilitic treatment may act radically when the syphilitic infection is the true indispensable etiologic factor and not a conditional factor pointing to a latent constitutional hemolytic icterus.

Policlinico, Rome

39: 125-164 (Jan. 25) 1932. Practical Section

Essential Character and Objectives of Clinical Instruction. C. Frugoni. —p. 125.
*External Secretion of Pancreas in Diabetes. Giuseppina Iacono.—p. 133.
Influence of Pyrrole Nucleus in Formation of Hemoglobin. L. Villa. —p. 137.

External Secretion of Pancreas in Diabetes. — Iacono states that her research on amyolytic, lipasic and proteolytic ferments led to the following conclusions: The amylase contained in the blood serum of diabetic persons is much diminished in relation to normal and also the amylase content of the urine and of the duodenal juice and of the feces, although the diminution is not as marked as in the blood serum. The small quantity of amylase is, however, not in direct relation to the degree of pancreatic lesion. In a person in good general condition, with moderate hyperglycemia and glycosuria, the quantity of diastase in the blood serum especially was notably reduced, while in others in more grave conditions the diminution was less marked. The lipase in the various enzymatic fluids of diabetic persons is likewise found to be diminished. The trypsin in diabetic persons did not show appreciable changes, so that it may be regarded as practically normal. Insulin treatment in diabetes increased notably the values of the diastase, and slightly those of the lipase, but left the trypsin unchanged.

Rassegna Internazionale di Clinica e Terapia, Naples

12: 1170-1200 (Dec. 31) 1931

*Application of Leeches in Phlebitis. A. Angeli.—p. 1180.

Application of Leeches in Phlebitis.—Angeli states that the treatment described and applied by Termier in cases of postoperative phlebitis of the lower limbs consists in the application of three or four leeches to the root of the thigh as early as possible. The application is repeated as much as three times at intervals of two days. To the method of Termier, Hanselmann has added the old trick of puncturing the belly of the leech when the latter, already filled with blood, is about to drop off. In this way, a greater extraction of blood and a notable prolongation of the period of sucking are secured. In case 1, a housewife, aged 46, entered the hospital, Aug. 23, 1925. Subtotal abdominal hysterectomy for fibroma was performed under ether anesthesia. On the tenth day, after the sutures of the aseptic operative wound had been removed, there was pain and a slight tumefaction of the right leg; the axillary temperature was 38.3 C. (101 F.). Hot, moist packs were applied, and when the tissues had become soft, four leeches were applied to the root of the thigh. The following morning the pain had disappeared. The edema receded definitively after the application of the second and third leech, with an interval of two days between applications. The high temperature disappeared on the fifth day. The patient was discharged as recovered, September 24. In case 3, a workman, aged 22, entered the hospital, Jan. 5, 1927, for diffuse phlebitis of the whole right leg, which developed from a crural adenitis of the same side incised at home eight days previously. The temperature was 38.3 C. (101 F.); there was a diffuse edema and pain. Medication was applied to the suppurative focus and also three leeches were applied in the manner described in case 1. The pain diminished and disappeared in four or five days. The fever receded entirely on the tenth day. The edema persisted although much diminished, even on the day the patient was discharged from the hospital (February 28). Two months later, when seen, the patient had completely recovered. At home he had used massage and gymnastic exercises. Eighteen further case histories are given, all of which were favorable to the use of the remedy.

Riforma Medica, Naples

48: 1-40 (Jan. 2) 1932

*Immediate Blood Changes Following Pneumothorax. G. Ferrari.—p. 5.
Influence of Sympathetic Nerves on Gastric Motility. G. Pieri and M. Lapenna.—p. 8.

Immediate Blood Changes Following Pneumothorax.—Ferrari's observations led him to conclude that the number of leukocytes, the blood pressure and the refractometric index, following pneumothorax, present constantly the changes that are encountered in the hemoclastic crisis. These symptoms are usually the same in recent pneumothorax as in that of older date. The color of the venous blood, possibly owing to the special influence of the pneumothorax on the oxygenation of the blood, presents a particular behavior, becoming at first darker and later slightly redder; as a rule, however, the differences are slight and not constant. The intensity of the reddening is not in direct relation to the lowering of the refraction index or a greater leukopenia. At first, the author had hoped to find in the changes in the sedimentation speed of erythro-

cytes an important factor capable of revealing directly the disturbances of colloidal equilibrium, but the research did not give clear results.

Terapia, Milan

21: 353-384 (Dec.) 1931

*Diphtheritic Toxoid in Treatment of Postdiphtheritic Paralysis. P. Piazza Sormani.—p. 362.
Seroprophylaxis and Serotherapy in Postoperative Bronchopulmonary Complications. A. Benvenuti.—p. 369.

Diphtheritic Toxoid in Treatment of Postdiphtheritic Paralysis.—Piazza Sormani reviews the postdiphtheritic paralytic accidents and states that nowadays they are of less frequent occurrence, owing to the early and lavish use of antidiphtheritic serum. Some paralytic sequelae resist serotherapy but are amenable to injections of toxoid even after several months have been wasted on various kinds of ineffective treatment, as illustrated by the history of the author's patient.

Archivos Argentinos de Pediatria, Buenos Aires

3: 1-60 (Jan.) 1932

*Hemorrhagic Subcutaneous Nodules. P. de Elizalde and P. R. Cervini.—p. 1.
Hemolytic Jaundice: Case Report and Remarks. P. R. Cervini and A. Grecco.—p. 9.
Congenital Aplasia of Femur. M. Gamboa and S. I. Nudelman.—p. 17.
Posttraumatic Painful Osteoporosis of Patella. J. M. Macera.—p. 23.
Diphtheritic Polyneuritis of Pseudotabetic Form in Untreated Young Diphtheria Patient. E. A. Beretervide, P. Alurralde and C. Ducco.—p. 33.
Septicopyemia from Amigdalotomy, Pleuropulmonary Localization. A. Puglisi and O. Maróttoli.—p. 42.

Hemorrhagic Subcutaneous Nodules.—De Elizalde and Cervini give the history of a normally born child, showing on the third day a jaundice which attained its maximum intensity about a month later, and presenting some purple nodules when examined on the fifty-second day of its life. The nodules were single, hard, adherent to the skin, slightly movable on the underlying tissues, of variable size (up to 1 cm. in diameter), and some were surrounded by ecchymotic zones reaching a diameter of 2 or 3 cm. They were localized on the anterior left and right deltoid, right pectoral and left mastoid regions and had already disappeared from the shoulder, the lumbar region and the upper part of the intergluteal sulcus. A slight degree of hepatomegaly and a well defined splenomegaly were present with marked anemia: red corpuscles 2,000,000, leukocytes 13,500, and enormous quantities of platelets. Histologic examination of a nodule showed epidermic and dermal layers normal, thickening of the arterial walls and fat lobules with empty fat cells between which were found masses of degenerated red blood corpuscles with numerous leukocytes (mononuclear and polymorphonuclear), accumulations of free pigment and pigment filled reticular cells. A newly organized fibrous layer circumscribed the nodule. The authors state that this pathologic entity has not been described up till now and that it is not constituted by ecchymoses or free hemorrhages, which would never produce the circumscribed, encapsulated nodules. They interpret the lesions as evolutive forms of some alteration of the subcutaneous adipose tissue, hitherto unknown in infants; in other words, they think that a secondary hemorrhage has occurred in the involved fatty tissue. Such being the case, it is surprising that no necrotic foci without hemorrhage were discovered although the authors made diligent search for them. Complete recovery within one and one-half months was uneventful.

Bol. y Trab. de la Soc. de Cirugia, Buenos Aires

15: 1119-1172 (Dec. 2) 1931

Lateral Gastroduodenostomy. O. Copello.—p. 1139.
*Xanthomatous Angiolymphangioma of Gingival Margin. J. M. Jorge and S. Nudelman.—p. 1143.
Subtotal Pylorogastrectomy in Polypoid Chronic Gastritis; Late Results. A. F. Landivar and R. González Bosch.—p. 1152.
Lumbosacral Radicular Paralysis After Spinal Anesthesia. O. Copello, V. Dimitri and J. Nain.—p. 1154.

Xanthomatous Angiolymphangioma of Gingival Margin.—Jorge and Nudelman report three cases of xanthomatous angiolymphangioma of the gingival margin in otherwise normal new-born infants. The tumor developed from the upper gum in two cases and from the lower gum in one case. It has an elastic consistency, is irreducible on pressure, and is attached to its point of insertion by a pedicle with a large number of normal and abnormally distended capillaries. It protrudes from the lips in the shape of an almond 1 cm. long by 0.5 cm. in diameter, and prevents suction by the infant. Surgery is the only treatment. Without anesthesia and after ligation of the pedicle, the tumor should be removed with curved scissors and the point of insertion should be cauterized, or the hemostasis may be obtained by one or two silk sutures. The scar rapidly disappears and no recurrences are observed. When the children are seen two or three years later they are normal in all respects and they show a normal implantation of the teeth. The author made microscopic examinations of the tumors in his cases. The tumors are vascular. They are formed by connective tissue with a large number of blood vessels and of lymphatic vessels in a xanthomatous condition through some process of degeneration. The formation of the tumor may be related to the formation of the maxillae in embryonic life, having as cause a local condition of stasis of the lymphatic vessels.

Brasil-Medico, Rio de Janeiro

46: 97-120 (Jan. 30) 1932

Red Granulosis of Nose. A. Aleixo.—p. 97.
Von Pirquet's Reaction in Schools. C. Pernetta.—p. 99.
*Use of "Tepid Spark" in Small Endo-Urethral Lesions. E. de Souza.—p. 103.
Bile and Temperament. B. Quental.—p. 106.

"Tepid Spark" in Urethral Lesions.—De Souza reviews the numerous procedures and agents used in chronic urethritis to extirpate the obstinate small endo-urethral lesions which prolong secretion and prevent a complete cure. He finds all usual procedures as well as chemical agents unsatisfactory and retains only the electrical method, with one electrode, as worthy of consideration. This method, originally proposed by Monbrun and Casteran, has the advantage of compactness and simplicity and uses only one electrode, one very light wire and one post of the diathermy apparatus; it does not interfere with the endoscopic manipulations, and delivers a current of minimum thermic intensity with extremely localized action and practically no penetration. When the electrode is put in contact with the lesion, coagulation takes place; but slight removal of the point of the electrode produces only a "tepid spark," 1 or 2 mm. long, much less painful and much less burning than the spark generated by all other methods, which, in contradistinction, deliver either a hot or a cold spark. The technic is used with the direct vision endoscope and the patient in the usual position but not having been allowed to empty the bladder immediately before the intervention. Coagulated parts are eliminated within eight days and the applications of the spark spaced accordingly.

Revista de Medicina, Rosario de Santa Fe

6: 309-345 (Sept.) 1931

Treatment of Obesity. J. Bauer.—p. 309.
*Treatment of Anal Fissures and Sphincteralgias with Progressive Diathermic Dilation of Anus. L. Cambies.—p. 320.

Treatment of Anal Fissures with Diathermic Dilation of Anus.—Cambies considers bipolar or tripolar diathermy, with high tension high frequency currents, a curative agent of considerable value in the treatment of certain pathologic anorectal conditions (anal fissure and hyperacute sphincteralgias). Diathermy has a healing effect on the linear ulcers at the margin of the anus, a curative action on the contracture of the anal sphincter (which is a characteristic of the anal fissure), and a sedative action on the pain of the sphincter. The author describes his technic by means of which he produces a progressive diathermic dilatation of the anus until the latter reaches its normal caliber. The treatments are given by means of an apparatus with two electrodes: one to be introduced into the rectum to act during the treatment as the active pole, and the other to be placed externally in the region of the liver, to secure an action from diathermy on the liver, on the portal circulation and on the hemorrhoidal veins. The rectal electrode, which the author calls "diathermal," consists of two olivary pieces of metal 1 cm. and 1.5 or 2 cm. in diameter, respectively. While the anal sphincter is constricted under painful spasms, the rectal electrode is not inserted into the

rectum, but instead it is applied externally in contact with the anus. Three or four diathermic treatments of about ten minutes' duration each, with currents of from 400 to 600 milliamperes, will produce an improvement both in the condition of the anus and in the contracture of the anal sphincter by which is would be possible to introduce into the rectum during treatment, without causing any pain to the patient, first the smallest, then the larger olivary piece of metal of the rectal electrode, and, later on, a conical common diathermic electrode of heavy walls. For this time, stronger currents than before (from 600 to 1,200 milliamperes) should be used, and the treatments should last longer than the previous ones (about fifteen or twenty minutes each). In even the most hopeless cases the patients are cured after about eight or ten treatments. The treatment is painless.' It can be successfully used, either alone or in association with the administration of sclerosing injections of quinine or urea in cases of internal hemorrhoids of a medium size. It is also applicable in checking hemorrhoidal hemorrhages. Patients seen some time after they were treated did not have recurrences. The author believes that diathermic currents of high frequency have a regulating action on the smooth muscle fibers through the nervous system. A case is reported.

Archiv für klinische Chirurgie, Berlin

169: 1-224 (Jan. 21) 1932

*Experimental Investigation on Action of Phosphorus on Bone Tissue. H. Hellner.—p. 1.
Experimental and Clinical Aspects of Pulmonary Embolism. B. Martin.—p. 17.
Wound Healing Following Aseptic Operations with Primary Wound Closure. R. Morian.—p. 36.
New Method of Early Diagnosis of Carcinoma. G. Bankow.—p. 50.
Shall Appendectomy Be Done During the Interval Following Appendicular Abscess? M. B. Jukelson.—p. 59.
Duodenum "Inversum," Form of Duodenum Mobile. P. Riess and R. Sandera.—p. 69.
*Genesis and Mode of Spreading of Erysipelas Carcinomatosum (Küttner). W. Brackertz.—p. 82.
Experimental Investigations on Cure of Bone Fractures in Hyperfunction of Suprarenals. A. S. Kosdoba.—p. 96.
Aspects of Intestinal Invagination. A. Gridnev.—p. 107.
Results of Nerve Division in Laparotomy. A. Ssoson-Jaroschewitsch.—p. 113.
*Modifiability of Callus Formation by Administration of Vitamin C. G. von Halász and J. Marx.—p. 121.
Scoliosis and Its Operative Treatment. Fenkner.—p. 132.
Postoperative Retention of Urine and Its Treatment with Köhler's Procedure. J. Marx.—p. 170.
Mesenteriolitis Appendicularis and Postappendicitic Changes of Venolymphatic System. E. Zapel.—p. 180.
Aspects of Phlegmon of Intestine. O. Bsteh.—p. 193.
Incidence of Benign Tumors of Vertebrae (Angioma, Lipoma and Osteoma). H. Junghanns.—p. 204.
Isolated Fracture of Transverse Process of Lumbar Vertebrae. K. Fränkel.—p. 213.
Tumor-Like Compression Defects of Colon. L. Haas.—p. 218.
Syringes for Punctures and Injections with Remarks on Their Sterilization. D. Kulenkampff.—p. 223.

Action of Phosphorus on Bone Tissue.—Hellner reports that he gave daily subcutaneous doses of 0.2 mg. of phosphorus in oil to rabbits weighing between 700 and 1,200 Gm. Continuous roentgenologic observation of these animals and of controls revealed that the regeneration of artificially produced bone defects was not influenced by the administration of phosphorus. Microscopy revealed no changes in the callus. Accordingly the author thinks that phosphorus does not exert a direct influence on bone regeneration. To another series of rabbits, weighing from 800 to 1,400 Gm., the author gave likewise daily subcutaneous injections of 0.2 mg. of phosphorus in olive oil. Already after ten days a layer of phosphorus was noticeable in the metaphysis, and in smaller animals (500 to 800 Gm.) 0.1 mg. of phosphorus in olive oil was sufficient to produce a layer of phosphorus in the metaphysis. It was also found that if phosphorus is administered to the nursing mother animal, phosphorus layers appear in the young animals in about the same time. Microscopic examination revealed that the morphologic foundation of the layer of phosphorus in the metaphysis was a retarded cartilage resorption in somewhat retarded bone apposition. The author concludes that theoretical reasoning justifies the use of phosphorus in cases of rapid degeneration of bony tissues. However, an acceleration of callus formation is not effected by phosphorus.

Genesis of Erysipelas Carcinomatosum.—Brackertz names various forms of cancer of the breast and then directs attention to the form which Küttner designated as erysipelas carcinomatosum. On the basis of a case history he demonstrates that the subepidermoidal spreading of the carcinoma in erysipelas carcinomatosum (Küttner) takes place primarily by the lymphatic route in the corium of the skin. When cases are reported in which carcinomatous thrombi are found in the capillaries of the skin, these are the result of secondary perforation into the vessel, after the carcinoma has already spread into the lymphatics of the skin. The question why in these cases the carcinoma spreads by way of the lymph channels of the skin is explained thus: If the deeper drainage channels have been blocked either by cancerous infiltration or by surgical division (amputation of mamma) the cancer process must follow the lymph channels of the skin. It is assumed that the inflammatory hyperemia in the corium, which causes the redness of the skin, is a reaction of the host tissue to the invading foreign carcinoma cells, for a bacterial cause of the erysipelas-like redness of the skin could not be detected. It is also demonstrated that the cancer infiltration reaches beyond the area of redness into the apparently healthy skin. This factor is considered the main cause of the unfavorable operative prognosis.

Modifiability of Callus Formation by Administration of Vitamin C.—In the introduction, von Halász and Marx direct attention to practical observations which indicate that vitamin deficiency retards healing of bone fractures. Further, they review the animal experiments that have been conducted to determine what particular vitamin is significant in callus formation, and then they relate their own investigations on the significance of vitamin C. Guinea-pigs with bone fractures were given, in addition to normal food, lemon juice and food containing abundant amounts of vitamin C. After six weeks the animals were killed. Then roentgenograms were made of the fractured extremities and the newly formed callus was subjected to histologic examination. When the results of these examinations were compared with those of the controls it was found that the callus of the animals that had received large quantities of vitamin C was not different from that of the controls. The authors reach the conclusion that vitamins are an important factor in the healing of bone fractures and an adequate vitamin supply is necessary for callus formation. However, in the normal organism the administration of vitamins does not hasten the healing of a bone fracture. In pseudarthroses in which vitamin deficiency is a causal factor, or in osteotomy or other interventions on the bone, which heal slowly because of a lack of vitamins, administration of vitamins is helpful.

Deutsches Archiv für klinische Medizin, Berlin

172: 335-428 (Jan. 8) 1932

Hemiatrophy of Tongue. H. Paal.—p. 335.
Regulation of Metabolism of Blood Pigments in Acute and Chronic Hemorrhagic Anemia and in Several Secondary Anemias. L. Heilmeyer.—p. 341.
*Biologic Value of Carbohydrates Contained in Fruits and Vegetables for Nutrition of Diabetic Patients. A. Athanasiou.—p. 358.
Significance of Chronaxia in Internal Medicine: Nutrition and Neuroregulation. T. Johannes.—p. 370.
Id.: Functional Courses in Nervous System in Their Entirety. T. Johannes.—p. 400.
Interpretation of Morphologic Changes in Spinal Cord and Brain in Acute Ascending Spinal Paralysis (Landry's Paralysis). W. H. Chase.—p. 412.

Value of Carbohydrates in Fruits and Vegetables for Nutrition of Diabetic Patients.—Athanasiou shows that the chemical analysis of foods is not sufficient to determine their value in the diabetic diet, because of the variety of the carbohydrates it contains and because of the great differences in splitting and resorption. The chemical analysis must be supplemented by the determination of the biologic value. This is done best by observation of the blood sugar curves during administration of the different foods. Twenty grams of carbohydrates from the various types of fruits and vegetables was tested in its effect on the blood sugar and considerable differences, often of several hundred per cent, were noted. Various kinds of nuts, blackberries (raw or cooked), raw peaches, raw Italian plums, cooked apples and beets were found

to be most favorable. Most fruits, such as pears, grapes, bananas, oranges and whortleberries, showed medium biologic value. Unfavorable proved apricots, dried and cooked peaches, raw or cooked currants, pineapple, raw cherries and dried and cooked figs. The results of the chemical and biologic tests and their significance in the diabetic diet are shown in a table.

Deutsche medizinische Wochenschrift, Leipzig

58: 163-202 (Jan. 29) 1932

Concurrence and Mutual Modification of Diseases. R. Rössle.—p. 163.
Dangers of So-Called Nonsurgical Interruption of Pregnancy. F. Engelman.—p. 166.
*Posttonsillitic Thrombophlebitic Sepsis. G. Jung and H. Wendt. —p. 169.
*Treatment of Diabetes During Childhood. H. Rau.—p. 171.
Treatment of Tabetic Atrophy of Optic Nerve. E. Weinberg.—p. 173.
Technic of Determination of Coagulation of Blood. W. Schultz.—p. 175.
Insulin and Coagulation of Blood. W. Wieck.—p. 177.
Loss of Sight (Hemorrhage of Vitreous Body) and Intra-Orbital Cauterization. C. Hamburger.—p. 178.

Posttonsillitic Thrombophlebitic Sepsis.—Jung and Wendt describe a case of posttonsillitic thrombophlebitic sepsis that was caused by hemolytic staphylococci. They consider this case noteworthy because timely ligation of the jugular vein, wide opening of the connective tissue spaces of the throat and later enucleation of the abscessed right tonsil effected cure.

Treatment of Diabetes During Childhood.—For the treatment of diabetes mellitus during childhood, Rau recommends a diet which constitutes a normal children's diet with comparatively large amounts of carbohydrates. To obtain a metabolic equilibrium it is necessary that insulin and diet be correctly distributed over the day. The administration of insulin should harmonize timely and quantitatively with the food intake. A diet that contains large amounts of carbohydrates does not necessitate the administration of larger or at least not of essentially larger quantities of insulin than a diet deficient in carbohydrates. Moreover, a diet with large amounts of carbohydrates permits storage of glycogen reserves, which in turn prevent the development of hypoglycemia.

Klinische Wochenschrift, Berlin

11: 177-224 (Jan. 30) 1932

Organ Inferiority and Heredity. F. Curtius.—p. 177.
Dissociation Experiments with B C G. Seiffert.—p. 181.
Physical Chemistry of Lipoids: Swelling and Specific Action of Anions. Mona Spiegel-Adolf.—p. 185.
*Hypochloremic Coma. O. Porges.—p. 186.
Spectrochemical Analysis of Serum Pigments. P. Müller.—p. 189.
*Influence of Liver Extract on Diabetic Patients. H. Steinitz.—p. 192.
Serologic Differential Diagnosis Between Syphilis, Gonorrhea and Tuberculosis. E. Witebsky.—p. 194.
Hemagglutination of Erythrocytes of Sheep by Specific Amboceptor: Foundation of Serodiagnosis of Syphilis in Active Serum Without Addition of Complement. W. Bachmann.—p. 196.
Obliteration of Colon as Result of Ulcerative Colitis. K. Neubürger. —p. 198.
Demonstrability of Spleen in Roentgen Picture as Test Method of Function of Spleen. T. Naegeli and C. von Scanzoni.—p. 200.
Idem. H. Baumann and K. Schilling.—p. 201.
Magnesium Content of Blood Under Normal and Pathologic Conditions, Especially in Renal Disturbances. E. Becher.—p. 202.
Heredity of Blood Groups. D. J. Buining.—p. 202.
Indications for Raw Fruit Diet. K. Eimer.—p. 203.
Roentgen Diagnosis in Tuberculosis Welfare Stations. H. Denker. —p. 207.

Hypochloremic Coma.—Porges describes a peculiar condition; namely, hypocloremic coma. In one case, which the author observed, the hypochloremic coma resulted from daily gastric irrigations that were performed because of pyloric stenosis. In a patient with cirrhosis of the liver, who had lost large amounts of sodium chloride as the result of ascites punctures and of diuretics and because of a diet deficient in sodium chloride, there developed cholemic manifestations with simultaneous hypochloremia. Administration of sodium chloride counteracted the condition.

Influence of Liver Extract on Diabetic Patients.—Steinitz tested the influence of liver extract on the blood sugar of diabetic patients. Experiments on thirty-six diabetic patients revealed that neither alone nor in combination with orally administered insulin does liver extract have the power to reduce the blood sugar content. Treatment with liver extract was tried in three cases of mild diabetes mellitus, but it proved ineffective.

Medizinische Klinik, Berlin

28: 141-176 (Jan. 29) 1932

*Relation Between Diabetes Mellitus and Sugar Consumption. E. Leschke.—p. 141.
Biologic Evaluation of Expectorants. E. Hesse, H. Müller and R. Nagel.—p. 144.
Physical and Physiologic Problems in Examination and Interpretation of Heart Sounds. F. Trendelenburg.—p. 146.
*New Method of Registration and Reproduction of Auscultation Phenomena. H. Sell.—p. 150.
Clinical and Didactic Significance of Objective Examination of Heart Sounds. K. Posener.—p. 152.
Symptom of Primary Streak Shaped Inhibition of Growth of Hair of Head. P. Neuda.—p. 154.
Number of Scarifications in Smallpox Vaccination. M. Cohn.—p. 157.
Test of Functional Capacity of Heart. A. Pfleiderer.—p. 158.
Short Electric Waves in Biology and Medicine. E. Schliephake.—p. 158.
Medical Treatment of Hyperacidity. A. Vogl and R. Hillebrand. —p. 161.

Relation Between Diabetes Mellitus and Sugar Consumption.—The assumption that the increased incidence of diabetes mellitus is a result of an increased sugar consumption, Leschke disproves on the basis of statistical reports. He thinks that cares, excitement and mental strain are largely responsible for the greater frequency of diabetes mellitus. As supporting evidence he cites the fact that in rural districts the mortality from diabetes mellitus has increased only slightly, whereas in urban districts the increase is considerable.

New Method of Reproduction of Auscultation Phenomena.—Sell, after enumerating some shortcomings of the condensator microphone, describes his new apparatus, which takes into account that body sounds are transmitted in the solid medium. The receiver is so constructed that it is susceptible to body sounds rather than to air sounds, and thus eliminates disturbances. Its mechanism is based on the principle of induction. The rapidity of the movements of the membrane are the essential factor, and since the rapidity is proportional to the frequency of a sound, the receiver's sensitivity increases with the sound frequency. The author shows that this is not a shortcoming but rather an advantage during reproduction in the special loud speaker which was constructed for the reproduction of body sounds recorded by the receiver. In evaluating the new apparatus the author emphasizes that it makes audible especially weak body sounds. The method is therefore particularly suitable for making fetal heart sounds audible. The great capacity of the apparatus makes it also possible to replace the loud speaker by a writing instrument or by a ticker, and to the latter a counting apparatus may eventually be attached.

Münchener medizinische Wochenschrift, Munich

79: 211-252 (Feb. 5) 1932

Sex Hormones and Aschheim-Zondek Reaction for Early Diagnosis of Pregnancy. K. Schlirf.—p. 211.
*Rapid Diagnosis of Pregnancy from Urine. K. Stricker.—p. 213.
Experiences with Seminal Vesical Reaction for Diagnosis of Pregnancy from Urine. E. J. Kraus.—p. 214.
*Diaphragmatic Folds, a Roentgen Symptom in Emphysema, Asthma and Chronic Bronchitis. G. A. Weltz.—p. 216.
Roentgen Irradiation in Exophthalmic Goiter and in Hyperthyreosis. H. Mezger and H. Schwennicke.—p. 218.
Intravenous Pyelography. Dyes.—p. 225.
Diagnosis of Suppurative Processes of Kidneys and Their Capsules. F. May.—p. 229.
Value of Roentgenoscopy During Delivery. F. Krauss.—p. 231.
Experiences with Intravenous Pyelography. B. Beuthner.—p. 232.
Varix of Vena Axillaris Following Influenza. R. Gutzeit.—p. 235.

Rapid Diagnosis of Pregnancy from Urine.—Stricker maintains that for ordinary cases the original Aschheim-Zondek reaction, which requires four days or more, is sufficient. However, in urgent cases, such as when a living extra-uterine pregnancy is to be determined, a more rapid test method is necessary. Zondek has devised several rapid methods, such as the precipitation reaction and the ether sugar method. But aside from the fact that these modifications are not always reliable, they shorten the test period only slightly, so that they still require about three days. A considerable shortening of the test period was made possible only when a different test animal, the rabbit, was employed. On rabbits, the pregnancy reaction of the urine can be completed in twenty-four hours, for in these animals a genital cycle does not exist, but the ovaries always contain mature follicles and ovulation takes place only after copulation. Injection of urine from gravidas with its hormonal content produces within twenty-four hours

the same manifestations in the ovaries that copulation does. The author describes the technic of the test and relates his own observations. He emphasizes that it is quicker than any of the other rapid reactions but thinks that it should be employed only in urgent cases.

Diaphragmatic Folds, a Roentgen Symptom in Asthma.—Weltz calls attention to the fact that the roentgenograms of the diaphragm often reveal arch and furrow formations that are most noticeable during deep inspiration and sometimes disappear during expiration. In cases in which the symptom is well defined, the right side shows three arches and the left side two. That these characteristic changes have not received much attention before, the author explains as probably being due to the fact that they were considered as adhesions. The author gained the impression that these diaphragmatic folds occur usually during asthma, chronic bronchitis and emphysema, and in order to determine whether this was a general occurrence he studied 200 roentgenograms. In 159 there was no furrow formation, in 25 there were slight furrows, and in 16 the typical furrow formation was noticeable. Of the latter sixteen patients, five had severe bronchial asthma, four had severe chronic bronchitis, three had a milder chronic bronchitis, two had marked emphysema and two had no complaints. In four of six patients with severe bronchial asthma, the roentgenograms showed the characteristic furrow formation. The roentgenograms of 100 healthy ski-runners revealed in eight instances a slight furrow formation; all the others were free from it. Of 100 patients with asthma from another clinic, only 17 were entirely without diaphragmatic folds; in 24 they were slight but in 59 they were pronounced. In one patient with asthma the author observed the diaphragmatic furrows for seven years, and from this he concludes that the condition is fairly permanent. In cases of cardiac asthma, diaphragmatic furrowing is not observable. The etiology of the diaphragmatic folds is as yet not entirely understood. The author considers two possibilities; namely, that either the barrel form of the chest causes passive tension and distortion of the diaphragm, or there exists a diaphragmatic spasm, a hypertension of the diaphragm.

Zeitschrift für klinische Medizin, Berlin

119: 293-550 (Jan. 22) 1932

*Clinical Aspects of Bronchial Asthma and of Related Conditions: Psychogenesis of Bronchial Asthma. E. Wittkower and H. Petow.—p. 293.

*Myeloma Disease: Bence-Jones Proteinuria. A. Magnus-Levy.—p. 307.

Bence-Jones Proteinuria and Renal Function: Clinical Aspects of Nephrotic Contracted Kidney. F. Mainzer.—p. 363.

Chemical Foundation of Ehrlich's Diazo Reaction in Urine. Paula Sachs.—p. 381.

Mechanism of Pale Hypertension: Phosphatide and Glutathione Contents of Blood in Pale and in Red Hypertension. H. Bohn and W. Schlapp.—p. 403.

Basal Metabolism and Hypertension. J. Becker.—p. 412.

Lipoid and Calcium Metabolism in Schüller-Christian's Disease. M. Kartagener and H. Fischer.—p. 421.

*New Form of Paroxysmal Hemoglobinuria. F. Rosenthal.—p. 449.

Malignant Diphtheria with Hemorrhagic Diathesis. E. Frank and E. Hartmann.—p. 460.

Great Efficacy of Orally Administered Thyroxine Sodium in Normal and in Hypothyroidal Persons. Béla Klein.—p. 477.

Experiences with Conservative and Surgical Treatment in Exophthalmic Goiter. V. M. Kogan-Jasny.—p. 492.

*Alleged Presence of Fluorine in Blood of Patients with Hemophilia. W. Brandes.—p. 504.

Changes in Position and Form of Colon and Their Clinical Significance. W. Brednow.—p. 508.

Prognosis in Stenocardia. G. J. Katz.—p. 520.

Hereditary Biology of Congenital Cardiac Defects. C. V. Medvei and H. Rösler.—p. 527.

"Gastrocardiac Syndrome" or "Cardiodiaphragmatic Syndrome." L. Roemheld.—p. 541.

Ergotamine and Regulation of Blood Sugar. Z. Ernst and E. Haintz.—p. 545.

Psychogenesis of Bronchial Asthma.—Wittkower and Petow point out that the significance of emotional excitement for the development of asthma was already recognized by Hippocrates and by many others. In recent decades, however, that is, since the discovery of anaphylaxis, the opinions about the pathogenesis of asthma have changed in that it is now generally considered as a manifestation of hypersusceptibility. The authors investigated to what extent psychic factors can still be considered as a cause, in spite of the results of allergic studies. They reach the conclusion that allergic genesis of asthma without a neurotic component is a fact in many cases of asthma. Psychogenic origin of asthma without somatic predisposition is possible; in some instances it is even probable, but it has not been definitely proved. In the majority of cases of asthma both factors are involved: it may be that in existing allergic predisposition, psychic factors mobilize the latent disorder and make it manifest; or it may be that asthma of allergic origin acquires secondarily a neurotic character.

Myeloma Disease: Bence-Jones Proteinuria.—Magnus-Levy shows that the elimination of Bence-Jones protein is largely determined by the nitrogen metabolism and that Bence-Jones protein is not exclusively an endogenous product. The constant repetition of the considerable loss is not possible without compensation from the protein intake. Proteins from various foods influence the Bence-Jones proteinuria differently. Of other influences only infection and perhaps other toxic actions have some significance. In the course of the disease, the elimination of Bence-Jones protein increases gradually. During short periods it may remain constant, but prolonged remissions are rare. In the cachectic state the elimination may decrease as a result of a reduction in the total nitrogen metabolism, of the decrease in the synthetic capacity of the cells, and as a result of retention during renal insufficiency. Complete disappearance of Bence-Jones proteinuria is never noted in true myelomas with considerable elimination; in cases with only slight proteinuria it disappears entirely only in rare instances. In cases with considerable Bence-Jones proteinuria, the ordinary types of serum proteins may not be present in the urine. Complete cessation of Bence-Jones proteinuria and alternation with types of serum proteins occur rarely. If they are detected, it is usually because the insoluble portions of Bence-Jones protein are mistaken for ordinary protein. Aside from the loss by way of the urine, the protein metabolism does not show marked deviations. Some investigators consider the energy balance as somewhat increased; however, the author thinks that this is probably the result of mistakes in the technic and that its direct relationship to the tumor has as yet not been definitely established. In cases in which proteinuria has reached the highest degree, the myelomas produce a quantity of Bence-Jones protein that is equal to one fifth of the protein content of the tumors. In proteinuria without myelomas the bone marrow is usually diseased, but the elimination of Bence-Jones protein is rarely more than a few grams. In from 20 to 25 per cent of myelomas, proteinuria is absent. Bence-Jones protein is demonstrable in the blood, in the exudates and, in smaller quantities, also in the bone marrow. The bone marrow is probably the site of formation of the Bence-Jones protein. The high degree of protein formation in myelomatosis has so far no counterpart in the metabolism of other tumors but rather in the formation of serum protein, which most likely takes place in the bone marrow. Normal bone marrow can (presumably) produce Bence-Jones protein and it is also assumed that myelomas that do not produce Bence-Jones protein may perhaps participate in the production of the normal serum proteins.

New Form of Paroxysmal Hemoglobinuria.—Rosenthal describes the symptomatology of a hemolytic usually leukopenic anemia with paroxysmal hemoglobinuria. It represents a disease entity which can be differentiated from other forms of hemolytic anemias and of paroxysmal hemoglobinurias, and can be coordinated with cold hemoglobinuria, marsh hemoglobinuria and paralytic hemoglobinuria as a fourth form of paroxysmal hemoglobinuria.

Fluorine in Blood of Patients with Hemophilia.—Brandes refers to studies by Stuber and Lang, who maintained that the retardation of the coagulation in patients with hemophilia is the result of an increased fluorine content of the blood of these patients. The author's investigations on this problem revealed that in the blood of normal persons and in the blood of hemophilic patients there are about the same minute quantities of fluorine, and he does not think that the retardation of the coagulation in the hemophilic patient is due to an increased fluorine content; for even if the fluorine content of the blood of hemophilic persons was as large as is stated by Stuber and Lang, these quantities would not be large enough to explain the considerable retardation which is characteristic for hemophilia.

Zeitschrift für Tuberkulose, Leipzig

63: 305-384 (Feb.) 1932

Value of Microscopic Examination, of Culture Method and of Animal Experiment in Detection of Smallest Quantities of Tubercle Bacilli. E. de Carvalho.—p. 305.
Diagnosis of Primary Bronchial Carcinoma by Means of Bronchography. G. Apitz.—p. 318.
*Sedimentation Speed of Blood in Dietary Treatment of Pulmonary Tuberculosis. M. Gerson.—p. 327.
Does Salt-Free Diet Have a Specific Effect on Tuberculosis? O. Schedtler.—p. 337.
*Direct Cultivation of Tubercle Bacilli from Blood According to Löwenstein's Method. Unverricht and S. Dosquet.—p. 338.
Studies on Tubercle Bacillemia in Patients with Pulmonary Tuberculosis According to Löwenstein's Culture Method. N. B. Oekonomopoulo, B. Papanikolaou and G. Joannides.—p. 340.
*Tuberculosis and Gestation. C. Waitz.—p. 343.

Sedimentation Speed of Blood in Dietary Treatment of Pulmonary Tuberculosis.—Gerson found that: 1. A marked increase in the sedimentation speed from two to eight weeks after beginning of the salt-free diet is a favorable sign. This initial increase in sedimentation speed makes the prognosis the more favorable the earlier it develops and the quicker it disappears again. 2. The protein content of the salt-free diet does not have a direct influence on the initial increase in the sedimentation speed, for it develops whether the salt-free diet contains large amounts of protein or is deficient in protein. 3. The absence of the initial increase in the sedimentation speed generally indicates an unfavorable prognosis, the more so if the patient's general condition is poor. 4. Short interruptions of the dietary treatment change the behavior of the sedimentation curve, and when the diet is resumed again there may be once more an "initial" increase. 5. An extremely slow increase of the sedimentation speed at the beginning of the salt-free diet can, with certain reservations, be taken as an indication that the course of the disease will be slow. Elimination of small amounts of sodium chloride supports this dianosis: elimination of large amounts contradicts it. 6. It may be an unfavorable sign if, after the initial increase, the sedimentation speed decreases only slowly or not at all. 7. If complications develop, or in case of relapse, there is a temporary increase in the sedimentation; but this is noticeable whether the patient has received dietary treatment or not. 8. Since the sedimentation reaction has only a qualified diagnostic applicability it should be considered together with all other clinical observations, but never alone. In connection with the clinical aspects, the blood picture, the sodium chloride control and the roentgenogram, the speed gives valuable information about the otherwise not recognizable reaction capacity of the organism of patients receiving dietary treatment.

Direct Cultivation of Tubercle Bacilli from Blood.—Unverricht and Dosquet report their experiences with Löwenstein's culture method. In ninety-one patients with pulmonary tuberculosis the culture method gave negative results in all but one case, in which severe tuberculosis occurred during puberty. In sixteen persons without tuberculous disease, the culture tests were likewise negative.

Tuberculosis and Gestation.—Waitz states that during gestation the tuberculin test shows a high percentage of positive reactions. As cause of the new tuberculous infection or of exacerbation of an old tuberculous focus he considers the increased sympathetic reactivity of the female organism during gestation. He thinks that the general practitioner or the gynecologist alone cannot decide the advisability of interruption of the pregnancy on account of tuberculosis, but that cooperation with specialists in tuberculosis is necessary for adequate care and treatment in such cases.

Zentralblatt für Chirurgie, Leipzig

59: 321-384 (Feb. 6) 1932

Successful Surgical Treatment of Relapsing Arterial Embolism. A. Westerborn.—p. 322.
Pancreatic Fistula and Pathologic Function of Pancreas. W. Zahn.—p. 328.
*Implant Into Wall of Bone in Surgical Treatment of Bone Fractures. W. Förster.—p. 335.
Late Abscesses Following Appendicitis. H. Angerer.—p. 340.
Abnormal Hemorrhage in Abortion. H. Krekel.—p. 343.
Treatment of Shallow Compressions of Articular Surfaces of Head of Tibia. O. Hultén.—p. 344.
Tension Bow for Flexible Wire in Extension Treatment of Fractures. R. Morian.—p. 349.

Implants in Surgical Treatment of Fractures.—Förster employs implants as splints for the wall of a fractured tubular bone. After exposing the fracture at a favorable site and following its reduction, he uses a circular saw with double blades to cut lengthwise, out of the wall of the bone, a long splint that extends from 3 to 6 cm. on each side of the fracture. The two parts of the bone splint are then pressed side by side into the groove, so that they bridge the fracture. This is possible because the combined thickness of the two saw blades is equal to the space in between, and consequently each portion of the splint is half the width of the groove. The author illustrates his method on diagrams and on bones of hogs. He found that the splinting alone is not sufficient but that it has to be fastened by catgut ligatures, which are first placed around the splint and then around the entire bone. Thus the splints are prevented from slipping into the medullary cavity and the reduced fracture is fastened more securely. In the conclusion the author recommends this method because the technic is not difficult and because it is physiologic, for it does not employ irritating foreign bodies such as screws, nails, metal plates and wires. About his experiences on human subjects he intends to report later.

Zentralblatt für Gynäkologie, Leipzig

56: 321-384 (Feb. 6) 1932

Treatment of Total Ectopy of Bladder in Adults. R. T. von Jaschke.—p. 322.
*A Vasomotor Phenomenon in Bladder for Early and Differential Diagnosis of Pregnancy. H. Högler.—p. 326.
Injury of Bladder, of Ureter and of Uterus After Artificial Abortion. G. Müller.—p. 331.
Vaginal Operative Treatment of Bilateral Ureterovaginal Fistula. A. Mandelstamm.—p. 334.
Ureteral Drainage After Operations of Vesicovaginal Fistulas. A. Kantor.—p. 341.
Ureter Duplex Bilateralis with Ampullar Dilatation and Blind Termination in Vagina. S. Vidaković.—p. 343.

Vasomotor Phenomenon in Bladder for Early Diagnosis of Pregnancy.—The phenomenon described by Högler is based on Muck's epinephrine probe test. Muck's test on the nasal mucous membrane of pregnant women revealed, during the early period as a rule, a sympathicotonic hypersensitiveness, but in the later months a vagotonic hypersensitiveness. These observations induced the author to make a similar test on the vesical mucous membrane, which he designates as the vesical epinephrine probe test. The bladder is prepared as for cystoscopic examination. According to the advancement of the pregnancy, it is filled with from 200 to 300 cc. of a 3 per cent solution of boric acid. Following the introduction and focusing of the ureteral cystoscope, a ureteral catheter is introduced and through this 5 cc. of a mixture of 1 cc. of epinephrine (1:1,000) and 4 cc. of a 3 per cent solution of boric acid is injected. The epinephrine is combined with the boric acid solution to facilitate a regular and rapid distribution in the bladder. A few seconds following this injection a noticeable ischemia appears on the floor of the bladder, which during pregnancy is hyperemic. After waiting two minutes, one advances the ureteral catheter until its point touches the vesical mucous membrane, and two lines are drawn lengthwise over the fundus and the trigon. If the reaction is positive there appears after about a minute a white streak sign, which is the result of vasoconstriction of the smallest vessels. The phenomenon disappears again after from three to thirty minutes. The author performed this vesical epinephrine probe test on 250 gravidas and on 100 nonpregnant women. A tabular report shows that during the first few months of pregnancy the proportion of positive reactions was considerably higher (82 per cent in the second month) than during the later months (only 18 per cent in the ninth month). In nonpregnant women the reaction was negative in all but five. The five with the positive reactions all had menopausal vasomotor disorders, and this is significant in that, as in pregnant women, there are frequently disorders that are similar to the menopausal vasomotor symptoms, such as dizziness, nausea, fainting, sudden paleness and a sensation of heat or cold in the hands and feet. In general the author's observations reveal that the abdominal sympathicus shows a behavior during pregnancy similar to that of the cerebral sympathicus; that is, in the first few months the sympathico-

tonic hypersensitiveness is more frequently demonstrable than during the later months. In women with a myomatous uterus the reaction is negative. It is likewise negative after the death of the fetus, and in tubal pregnancy.

Polska Gazeta Lekarska, Lwów

11: 117-136 (Feb. 14) 1932

Problems of Modern Technic of Anesthesia During Surgical Operations. (C'cn.) H. Hilarowicz.—p. 117.
Perforated Uterus. J. Ross.—p. 120.
*Action of Extract of Posterior Lobe of Pituitary After Intra-muscular Injection into Cervix Uteri. T. Heller.—p. 124.
Propagation of Polish Medicine. S. Konopka.—p. 125.

Action of Solution of Pituitary Injected Intracervically.—It is generally known that solution of pituitary, injected hypodermically or intramuscularly, begins to act after from five to ten minutes. Heller obtains contraction of the uterus in from five to ten seconds by injecting 1 cc. of the drug directly into the cervix uteri, as a routine in postpartum hemorrhage and also when there is bleeding after vaginal cesarotomy or after curettage. The results are reported satisfactory in about 2,000 cases that have been noted by the author during the last eight years.

Finska Läkaresällskapets Handlingar, Helsingfors

73: 903-1025 (Dec.) 1931

Perception of Musical Sounds. F. Leiri.—p. 911.
*Local Conservative Treatment of Tuberculous Spondylitis: Report on Methods and Results of Treatment at Hogsand Sanatorium During Last Seven Years. Viva Lagerborg.—p. 945.
*Appointment of Blood Groups Among Swedish-Speaking Persons in Finland. O. Sievers.—p. 960.
*Roentgen Diagnosis of Noncarcinomatous Gastric Tumor. E. Ruin.—p. 970.
Postoperative Gonioscopic Examination of Eyes in Glaucoma. S. Werner.—p. 981.

Local Conservative Treatment of Tuberculous Spondylitis.—Lagerborg reports fifty cases with ended treatment, Lorentz's plaster bed being the favorite method. The duration of bed treatment was from twelve to forty-five months, depending on the nature and localization of the condition. There was recurrence in five cases. Positive results were obtained in 82 per cent of the cases.

Blood Groups Among Swedish-Speaking Persons.—Sievers finds that of 6,108 Swedish-speaking persons born in Finland, 34.6 per cent belong to type O, 43.9 per cent to type A, 16.6 per cent to type B and 5 per cent to type AB.

Roentgen Diagnosis of Noncarcinomatous Gastric Tumors.—Ruin describes two cases of tumors of the stomach of distinctly mesenchymal origin. The roentgen picture in both cases was characterized by the unusually sharp and even contour of the tumor defect and by the absence of a barium covering within the field of the tumor; the wall of the stomach was soft and yielding close up to the tumor. These results are considered as pathognomonic for larger, noncarcinomatous tumors of the stomach without stenosis of the pylorus.

Nordisk Medicinsk Tidskrift, Uppsala

4: 49-64 (Jan. 23) 1932

*Recent Investigations on the Biology of Tumor Cells. A. Fischer.—p. 49.
Psychogenic Hyperventilation Tetany: Report of Case. B. Sjövall.—p. 55.
International Neurologic Congress in Bern from Aug. 31 to Sept. 4, 1931. R. Eeg-Olofsson.—p. 59.

Biology of Tumor Cells.—Fischer says that the malignant characteristics of cancer tissue depend on a specific cancer cell. Thus far no qualitative differences between malignant and normal tissue cells have been found; with regard to glycolysis and proteolysis, ability to build up new protoplasm from the blood plasma as the sole nutritive source, and on the whole in other respects, cancer cells are distinguished only quantitatively from normal cells. Cultivation of the tissue cells under conditions closely approaching those in the organism, i. e., without the addition of growth-producing substances, has given valuable information as to regeneration and differentiation. The understanding of the mechanism of the unlimited growth of the tumor cells in the organism is based on measurements of the rate of growth and experiments in cultivation of normal and malignant tissues side by side. The reciprocal action between normal and malignant cells consists in mutual stimulation to growth, stroma reaction, infiltration and destruction. Further, in tissue cell colonies in which growth is kept at a suitably slow rate, the rate of growth is considerably increased by repeated infliction of slight mutilations on the cultures. The tumor cells are far less resistant to injury than are normal cells and their lifetime is short, which explains the greater number of mitoses in cultures of carcinoma cells than in cultures of normal cells. The unlimited proliferation of tumor cells in the organism is thus believed to be the physiologic result of the spontaneous destruction of cells, just as normal regeneration follows injury of cells.

4: 65-80 (Jan. 30) 1932

*Primary Tuberculous Infection in Adults. M. Arborelius.—p. 65.
*By-Effects in Transfusion of Citrated Blood. R. Gärdstam.—p. 70.

Primary Tuberculous Infection in Adults.—Arborelius says that the adult with primary tuberculous infection has as a rule fairly recently moved into an environment with greater possibilities for tuberculous infection. The onset is acute, with more or less marked fever. Occasionally, erythema nodosum appears as an easily recognized initial exanthem; with such an eruption in younger persons the possibility of a primary infection should be borne in mind. There are further a pronounced sensitivity to tuberculin in the skin, marked rise in the sedimentation reaction, and pulmonary changes, mainly manifest as a roentgenologically demonstrable perihilar infiltrate of the lung. In addition to these typical cases a number of less marked and abortive cases and latent infections without definite symptoms occur. Four typical cases with different forms of primary infection are cited.

By-Effects in Transfusion of Citrated Blood.—Gärdstam says that, in cases of nonpernicious anemia, chills are about equally frequent following transfusion with citrated and with whole blood. In cases of pernicious anemia, however, transfusion of whole blood is considerably superior, and, with the present form of the method, transfusions of citrated blood should not be given in these cases. Experiences in fourteen cases of "drop transfusion" seem to him to indicate that, by reducing the speed of the infusion, chills after the transfusion and probably also graver effects of the transfusion may be avoided.

Norsk Magasin for Lægevidenskapen, Oslo

93: 1-112 (Jan.) 1932

*Effect of Small Quantities of Boric Acid on Living Organism. K. Hansen and K. E. Gloppe.—p. 1.
Cancer of Breast with Metastases to Intestine and Urinary Bladder: Case. P. Treider.—p. 29.
*Diabetes and Pregnancy. C. Bruusgaard.—p. 33.
Initial Infraclavicular Pulmonary Tuberculosis (German "Frühinfiltrat"): Case. O. Berner.—p. 53.
*Tetanus in Spite of Prophylactic Treatment with Serum. E. Moen.—p. 57.

Effect of Small Quantities of Boric Acid on Living Organism.—The results of the experiments of Hansen and Gloppe testify against the general conception of a specifically increasing effect of boric acid on metabolism, particularly on fat combustion.

Diabetes and Pregnancy.—Bruusgaard has treated twelve diabetic gravidas during seventeen pregnancies. The patient treated before the time of insulin died. Of the children eight, or 47 per cent, died. In the graver forms of diabetes, he says, a number of dangerous complications may set in, and constant supervision, preferably hospital care, is necessary. Insulin treatment is well borne. Delivery does not depart from the usual course, and the usual disorders of pregnancy are not increased.

Tetanus in Spite of Prophylactic Treatment with Serum.—Moen reports that of the patients given antitetanus serum in Ullevål Hospital from 1912 to 1931, three developed tetanus. In two cases the serum treatment, although instituted promptly, was not complete, but the third case is considered unique, as the strictest requirements for prophylactic treatment were fulfilled. Serum treatment was given three times at intervals of five days, the first time less than two hours after the injury. The first symptoms of tetanus set in only three days after the last injection. Commenting on this case, Ustvedt recommended that in patients with large wounds and extensive necroses the serum dosage be increased and possibly therapeutic instead of prophylactic doses given.